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JULY 20, 1953
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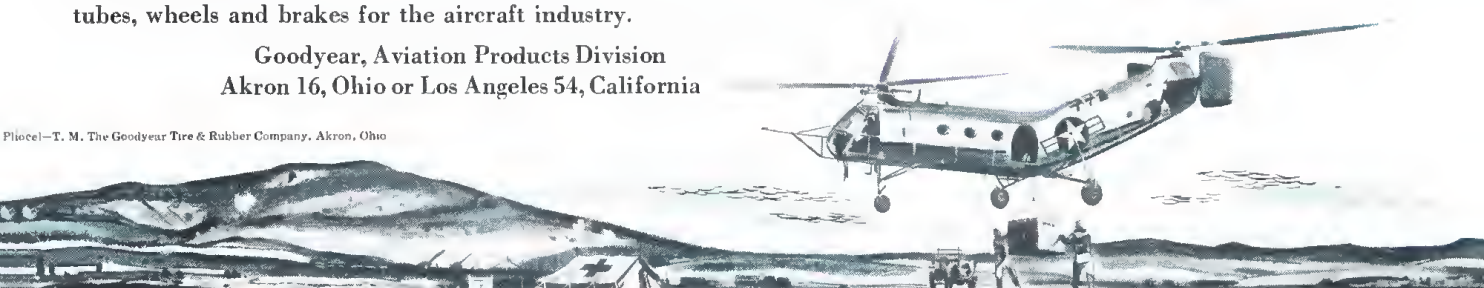

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Aviation Week

Volume 59 — July 20, 1953 — Number 3

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NEWS DIGEST

Damestic

An explosion apparently caused the crash of a Transocean Air Lines DC-6B July 11, scattering parts of the transport and bodies of 50 passengers and eight crew members over a wide area 350 mi east of Wake Island, a Naval rescue ship reported last week. Navy ordered a sea-air search discontinued four days after the crash when the rescue ship Barrett, which had picked up 14 bodies from shark-infested waters, radioed that there was "no possible chance of finding survivors alive."

TWA navigators strike, touched off by a July 10 walkout of 94 Airlines Navigators Assn. (CIO) members, forced the carrier last week to cut trans-Atlantic flights to 25% of normal operations. ANA called the strike to protest withdrawal of navigators from TWA's Rome-Paris flights. The airline had been hit July 4 by a "sick strike" of ground personnel.

New York Airways reports heavy mail loads have forced it to limit the new inter-airport helicopter flights to one or two passengers since the La Guardia-Idlewild International-Newark shuttle service was inaugurated July 9.

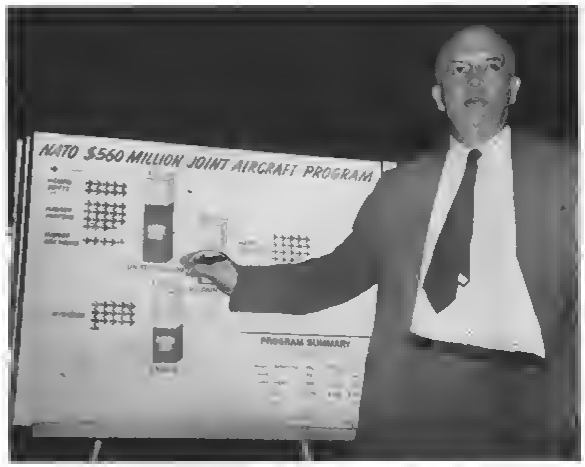
Airmail pay claim filed by Capital Airlines against the Post Office for $184,701 was denied last week by a U. S. Court of Claims. Postmaster General had deducted the sum from payments made to Capital between Jan. 1, 1949 Oct. 1, 1951, claiming the refund under a rate set by CAB.

McDonnell FH-1—Navy's first operational jet fighter—was taken out of service at Naval Reserve training base this month, nearly seven years after the Phantom began flying off U. S. aircraft carriers. North American FJ-1 Fury jet was retired simultaneously with the FH-1.

New labor agreement has been signed by Eastern, United, Trans World, Capital, National and Northwest Orient Airlines with the International Association of Machinists (AFL), granting a wage increase of nine cents an hour to an estimated 20,000 ground personnel.

Richard Von Mises, 70, pioneer authority on powered flight and retired professor of aerodynamics at Harvard University, died July 14 in Boston.

Robert B. Murray, Jr., Undersecretary of Commerce for Transportation, has been appointed a member of the National Advisory Committee for Aeronautics. He succeeds W. S. Davis, who resigned.



Stassen Pleads NATO Air Cause

Mutual Security Agency director Harold E. Stassen uses a chart portraying North Atlantic Treaty Organization's joint aircraft procurement program while testifying before the Senate Appropriations Subcommittee on foreign aid requirements. Light portion of each block indicates each country's contribution to the program, the dark portion, U. S. off-shore procurement. Each one of the aircraft silhouettes represents 25 planes. Stassen stated $5 billion are needed for foreign aid in the current fiscal year.

Air Materiel Command has merged its Los Angeles and Glendale regions into one administration for AF contracts other than prime airframe.

Harold E. Bowman, 59, secretary-treasurer of Boeing Airplane Co., died of a heart attack July 4 in Seattle.

New $8.5-million terminal building at Newark (N. J.) Airport will be dedicated July 29 at ceremonies which will celebrate the field's 25th anniversary and the 50th anniversary of powered flight.

Financial

Alaska Airlines reports net profit for the first half of fiscal 1953 totaled $10,338, compared with a net loss of $1,136,654 during the first six months of last year. Operating revenues were $2,381,608, a $719,527 increase over 1952.

Pan American World Airways has declared a stock dividend of 25 cents per share, payable July 31.

Internatianal

Boulton Paul P.111A, British delta-wing research jet, has been test flown at the Ministry of Supply's experimental establishment, Boscombe Down, England. The Rolls-Royce Nene-powered aircraft is expected to make its public debut in September at the SBAC flying display.

RCAF Comet 1A set an unofficial Ottawa-Washington speed record this month, flying the 470-mi. trip in 95 min.

Bristol is building three 173 Mk. 3 twin engine 16-seat copters for experimental use by British European Airways. First copter is expected to fly next summer but BEA may not have the craft in service much before 1957. The Mk. 3 differs from the earlier Mk. 1 in its stub wings and more powerful 850-hp. Alvis Leonides engines. Top speed will be 153 mph., cruising speed 138 mph. Gross weight will be 13,500 lb.

The Aviation Week

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Headline News

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7—Wide World, 9—(bottom) Boeing, 15—USAF, 16—Butler-Green, 39—(top) Fairchild Engine & Airplane Corp., (all others) Howard Levy, 75—McGraw-Hill World News, 78—Howard Levy

SEEING DOUBLE—Two twin-engine Cessna 310 executive transports fly a close formation near Wichita. In the background is initial prototype; nearest camera is the second Cessna twin that first flew recently. First 310 is being used as a modification test bed, while the second craft undergoes a 1,000-hr. accelerated service test. This program is expected to enable start of production in early 1954 as scheduled.

Latest Transport Models in the Air

NEW BLACKBURN FREIGHTER—First Blackburn Beverley transport (right), which recently made its first flight, shows off its new tailboom, larger than one fitted to earlier Universal transport and with window ports. Powered by four Bristol Centaurus engines, the 162-ft.-span Beverley is being produced for the RAF for cargo and troop carrying. Heavy equipment can be loaded into rear of fuselage.

LATEST STRATOFREIGHTER ALOFT—Auxiliary fuel tanks slung under the wings mark the latest version of the Boeing Stratofreighter tanker transport, the KC-97G. The new model can carry cargo without removing the Flying Boom pod. Engines are P&WA R4360-59s, also on KC-97F.

Remington Rand Methods News

How the U.S.A.F. Simplifies Production Control With Remington Rand Sched-U-Graph

Proper control of manufacturing and repair operations at Tinker A F Base, Oklahoma, requires that detailed, accurate and up-to-date facts be available on four major points.

1) What aircraft do we have on hand for overhauling and repair?
2) What assemblies and parts are available for use, or require repairing and are repairable?
3) What manpower is needed to do this work, and what is our manpower backlog?
4) What progress are we making in completing each of the types of repair work and manufacture assigned to us?

These operations at Tinker are on a colossal scale The central unit may be visualized by imagining a great World's Fair under one roof, covering 40 acres, with a repair assembly line three-quarters of a mile long

Formerly, the thousands of facts and figures necessary were buried in statistical reports, tub files, registers, and various card files Now they are all combined on Sched-U-Graph boards ranged along a wall of one office

The Sched U-Graph boards make possible detailed comprehensive control over all operations With each line item are all pertinent particulars followed by a 12-month calendar broken down by weeks Colored signals code the record in detail and show actual performance against the schedule No time is required to absorb a mass of reports and statistics, a glance at the Sched-U-Graph boards shows just how operations stand at any given moment.

So important are these Sched-U-Graph systems that they have been approved for installation at all AMC depots Essentially, the idea is an extension, on a scale not heretofore attempted, of the visible card method of recording It offers the same fundamental advantages, namely, convenient *charting* of status, item by item and integration of full supporting data in the same easily accessible record. Get the full story on this U S A F operation—ask for **CR795.**

10 Key Adding Machines Speed Figurework in Wage Computations

One of the large aircraft engine manufacturers has installed over one hundred Remington Rand 10-Key Adding Machines for cost accounting and wage computation An important factor in the selection of these machines was the speed and accuracy made available, with the briefest training period, through the touch system of operation For full information on this installation ask for free folder **CR862.**

It's Here. The New, Completely Descriptive, Low-Cost Bookkeeping Machine

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WHO'S WHERE

In the Front Office

Rear Adm. Lawrence B Richardson (USN Ret), senior vice president of General Dynamics Corp and board vice chairman of Consolidated Vultee Corp and Canadair, has joined the board of Hiller Helicopters, Palo Alto, Calif

Mike Cole has resigned as vice president traffic and sales of Bonanza Airlines to become vice president and general manager of Wilds Travel Service, Las Vegas, Nev

William A. Keetch has been elected vice president-engineering of Robinson Aviation Teterboro, N J.

Promotions

William J. Mitchell has been appointed assistant to the vice president-traffic and sales of Allegheny Airlines **Harvey M. Thompson** is new Allegheny director of operations

Frank R. Cook has become director of research and planning for the Aeronautical Div , Minneapolis-Honeywell Regulator Co , Minneapolis

Edward V. Albert has been promoted to product planning engineer for transport planes at General Electric Co 's Aircraft Gas Turbine Div , Cincinnati

Charles Larrabee is new superintendent of agency and interline sales for Pan American World Airways Latin American Div , succeeding Shelby W. Merrill, who becomes cargo sales superintendent

Albert M. Farr has been appointed eastern regional sales manager in Boston for Flying Tiger Line

George E. Beringer has been promoted to general factory manager of the aircraft section, Bendix Products Div , Bendix Aviation Corp , South Bend, Ind.

William Zadra is new superintendent of line maintenance for Philippine Air Lines **Francis W. Hall, Jr.,** will be transferred to Mexico City on temporary assignment in connection with inauguration of PAL service between San Francisco and Mexico

Frank R. Oradat, Jr., has been named chief engineer of Regent Aircraft, Edinburg, Tex

Changes

O. L. Andrews has resigned as director of the South Carolina Aeronautics Commission to resume duties as manager of the Greenville (S C) Municipal Airport **Charles B Culbertson** is new director

Walt Fellers, former North American Aviation assistant chief of aerodynamics, has joined the engineering staff of Fletcher Aviation Corp , Pasadena, Calif

Benson Hamlin, formerly in charge of Bell Aircraft's experimental helicopter flight tests, is now executive engineer of Stanley Aviation Corp , Buffalo, N Y

Mrs. Frances W. Nolde, 1949 winner of the All Women's Transcontinental Air Race, has received appointment as a consultant to the Defense Air Transportation Administration

INDUSTRY OBSERVER

► **USAF flight tests with the Cessna L-19B powered with a Boeing Model 500 turboprop have reached an altitude of 30,000 ft. High fuel consumption, however, offers a limited range Cessna is also installing an Artouste turboprop experimentally in another L-19. The Artouste is designed by the French Turboméca firm and built in this country by Continental Motors.**

► NATO standing group in Washington has approved a requirement for a lightweight, high performance fighter for use by NATO forces Lockheed is the leading U S contender, with work well along on construction of two F-104 prototypes Douglas, Northrop and North American also have lightweight fighter proposals British are pushing the Folland Gnat (FO 141) and the French have two proposals including a Dassault delta design

► **During recent altitude tests of an Olympus-powered Canberra, Bristol test pilot Wing Comdr. W. F. Gibb demonstrated he could relight his engines pretty much at will up to the new record of 63,668 ft That is significant since British engine designers have been studying relighting a great deal recently on the theory that cutting down two engines on a four-jet plane in flight might nearly double range Present relighting methods On some engines like the Olympus, it has been found that normal starting procedure will work at altitude, if compressor efficiency is high enough, put the aircraft into a dive and open the high-pressure fuel cock—the resulting windmilling can relight the engine.**

► Bristol Aeroplane Co , Ltd , is plugging turboprops for non-stop, trans-Atlantic service Bristol designers suggest an enlarged Britannia, powered by a twin spool turboprop While speed would be only about 500 mph , or 100 mph. slower than British pure-jet projects, Bristol argues that economy would more than make up the difference.

► **A Cessna 180 flew continuously for 10 hr 14 min on a standard 60-gal fuel supply during recent Detroit International Aviation Exposition Plane was standard 180, powered by 225 hp. Continental engine forming Hartzell constant-speed prop Average fuel consumption was 4 4 gal. per hour; true airspeed exceeded 110 mph**

► Vickers has canceled plans to send a Viscount 700 on sales tour of U S., but hopes to sell to U S affiliated airlines overseas—Middle East Air Lines, Panair do Brasil Meanwhile, a pre-production Viscount 800 (with 66 seats, against 48 for the 700) is being pushed While there are not more than 50% common parts between the 700 and 800, Vickers hopes to make savings by standardizing spares on the two types

► **Royal Canadian Air Force's second Comet jet transport recently blew four tires at Mitchel AFB, N. Y., on the return flight of an Ottawa-Washington, D. C., roundtrip. Here is what happened, according to RCAF: Rivets holding bottom damper struts to main landing gear leg failed, this allowed front wheels of bogie on port side of the aircraft to contact runway first, resulting in one front and both rear tires on that bogie to blow out (With damper struts in correct position, rear wheels contact runway first.) A rear tire on the starboard bogie also blew. Landing was smooth despite the blowouts, plane's occupants said. New tires were flown in to Mitchel and the plane returned to its Ottawa base the following morning**

► First F-84F from General Motors' Buick-Oldsmobile-Pontiac assembly line in Kansas City, Kan , has completed its initial flight test

► Design work on Avro-Canada's CF-104, successor to Canada's first home-designed-and-built jet fighter, the CF-100, is reported progressing at Toronto

► Wright Aeronautical Div is flying its J67 (developed from British Olympus) in a B-29 test bed at Wood Ridge, N J Engine is suspended from B-29 bomb bay Wright has been testing its J65 on a B-17

► **Avro's 707C delta trainer has flown. The side-by-side jet will be used to train Vulcan bomber pilots (photo on p 14)**

Washington Roundup

New JCS Starts Moving

The new Joint Chiefs of Staff already has started fact-finding for a re-evaluation of service roles and missions and force levels, although, aside from USAF's Chief, Gen Nathan Twining, who is now on the job, they won't be sworn in officially until mid August. Some aspects of the review Washington observers are noting:

• Defense Secretary Charles Wilson has set a firm deadline of October for its completion so the findings can be taken into account in the drafting of the fiscal 1955 military budget. This quells the great congressional fear the review would drag on and on. Democrats had suspicions the Administration might use it as an excuse to hold down the Air Force buildup indefinitely.

There was good reason for concern. The last strategic blueprint—the Key West agreement—was two and a half years in the making, and then drew only fuzzy lines on service jurisdiction.

• But Wilson's speedup directive has touched off new congressional apprehension that the new Secretary, empowered with sweeping authority under the recent Defense Department reorganization plan, will dictate decisions unilaterally on issues in controversy. This could mean a sharp blow to the service, whose position might be rejected.

Under the old give-and-take system of letting the Chiefs of the three services—as far as possible—compromise issues, the blows were soft.

• The term "wing" is likely to be junked as a yardstick for Air Force strength. Wilson and his supporters have made it emphatically clear they do not like it. They complain it gives no hint of what type of planes or how many comprise USAF's striking power. It may be that USAF's force level will be put in terms of operating aircraft and first- and second-line aircraft, after the Navy pattern.

This would also have a political advantage for the Administration. It would then be difficult to compare directly or succinctly the new force goal to the old JCS 143 wing goal. Democrats would be hard put to make an AF cutback—if there should be one—a major issue.

Wilson's Changes of Heart

USAF proponents have unearthed statements by Defense Secretary Wilson—before his differences with Gen. Hoyt Vandenberg exploded into war—that do not jibe with his present position.

• **Wilson has now discarded** the 143-wing goal for a 120-wing goal. But before Budget Director Joseph Dodge laid down a $5 billion slash in the defense budget, Wilson told congressmen he would not consider any change in the military force levels set by the JCS, but would aim to make savings within these levels. He said:

"At this late date (in drawing up a fiscal 1954 budget) it is hard to do much in the fundamental area. . . . I have not considered trying to change the basic objectives. . . . You do not expect me to be a military expert. . . . For instance, let us talk about the 143-wing program. I have not considered a change in that. But anything that we find that we do not absolutely need, we are going to drop out of the program. . . ."

• **Wilson and his supporters** now point critically at unused USAF funds as an indication of lax management. But sometime back he took credit for holding back USAF in obligating its money on hand. Wilson said: "I am sure there are several billion dollars more that would have been obligated at this time if we had not taken action to reduce the rate at which they were making commitments."

• **Wilson's current testimony** of USAF "fat and inefficiency" doesn't match with his testimony to a congressional committee two months back: "The Air Force had a tremendous job to do. I do not know how they did as well as they did."

Bitterness, Unlimited

The battle over USAF's budget is touching off more cutting personal attacks and bitterness than Capitol military observers have noted since the 1949 battle over the B-36 strategic bomber. Some developments:

• Rep. Barratt O'Hara took the floor to speak out against the Administration's designation of Assistant Defense Secretary (Comptroller) W. J. McNeil to attend the retirement ceremony for former USAF Chief of Staff, Gen. Hoyt Vandenberg. McNeil is a major opponent of Vandenberg in the budget fight.

Neither the President, Secretary Wilson, nor Undersecretary Roger Kyes attended. O'Hara commented: "It seems to me a lot on the shabby side. Why was Gen. Vandenberg being given the 'cold shoulder' on retirement after 30 years of outstanding service to his country? The reason, of course, is the position he has taken on curtailing the Air Force."

• In addition to McNeil, a rear admiral during the war now referred to as "Adm. McNeil" by USAF proponents, other key Defense Department officials have been singled out as pro-Navy and maneuvering against USAF.

Lyle Garlock, McNeil's assistant in charge of budgeting all aircraft procurement for the military, who served as a Naval officer during the war.

Struve Hensel, now general counsel for Defense Department (a post that is slated to rate Assistant Secretary status) who formerly was general counsel for the Navy Department. He is pointed to as a leader in the Navy fight against unification.

New USAF Attack?

Some representatives and senators are now gathering data on the age and experience for various ranking Air Force officers and comparing them with the experience of officers of equal rank in the other services.

There may be public speeches attacking—as one senator put it—"the absurd rank of young officers in the Air Force." It is well known that because of the big USAF buildup—from 42 to 143 wings—officers have been up-graded more rapidly than in the Army or Navy.

Washington Promotion

Airline promotion of government good will may be proper management expense, but cannot be subsidized by the government, Civil Aeronautics Board counsel says. Counsel recommends disallowance of mail pay asked by Pan American Airways for "Washington promotion" by J. Carrol Cone and William McEvoy, such as McEvoy's European travel to help Margaret Truman "should she require emergency return transportation."

—Katherine Johnsen

AVIATION WEEK

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Senator Blasts Air Force Management

- **Welker's attack is prelude to bitter Senate showdown, expected this week, on pared fiscal 1954 budget.**
- **Idaho Republican says only two-thirds of current 93-wing force is equipped with modern aircraft.**

Idaho Sen. Herman Welker's full-dress attack on the Air Force—the most vitriolic and sarcastic of USAF's five-year life—was prelude for a bitter Senate showdown, probably this week, on USAF's coming year budget.

"Because of inaccurate planning, inaccurate estimates, ineffective and inefficient management," Welker declared, the USAF, "after fantastic expense," is now no more than a "half-shot' Air Force." He ridiculed USAF for thinking "that you can stick feathers on a dollar bill and convert it into an air wing."

▶ **Wilson Budget Cut**—The House trimmed $240 million off the $11.2 billion Defense Secretary Charles Wilson recommended for USAF for fiscal 1954 (exclusive of public works). The Wilson estimate is $5 billion below the Truman estimate of $16 billion.

The House action was taken in the face of a plea by recently retired Air Force Chief of Staff, Gen. Hoyt Vandenberg, that $1.17 billion of the Wilson slash be restored to keep USAF on the road to a 143-wing force. With Senate action decisive on the budget because of the House turndown, Vandenberg supporters, with former USAF Secretary, Sen. Stuart Symington, taking the lead, are readying for all-out battle.

▶ **Welker Blast**—"As a result of having succeeded in previous years in terrorizing the people and the Congress," Welker concluded, the Air Force has "evidently become convinced that their branch of the armed forces is mightier than the President, mightier than any civilian Secretary, mightier than the Congress. After all, they have thrice whipped a past President on the same issue, so I suppose their arrogant attitude is understandable." (On the question of funds for the 70-group USAF program, the House twice overruled President Truman and the Senate finally went along.)

He said that "those seeking power in the air—combat, not verbal—ought to be conceding frankly that greater progress is to be made" under the Wilson program, "instead of holding to the long-time fixation that dollars can fly."

A "stupendous point" has been made that the Joint Chiefs of Staff approved "this hypnotic number 143" for air wings, Welker observed. But, he said, this is meaningless without stipulation as to what should constitute a wing in numbers and types of planes.

▶ **His Analysis**—This is how Welker analyzed current USAF strength:

• "We are asked to believe that we have 106 wings. This would leave us only 37 more to get before we reach what has been called a 'one-shot' Air Force. But 12 of these 106 wings—whatever a wing is—are simply on paper. . . . What is lacking is the airplanes. Of course they do have the generals, the colonels, and other officers. . . ."

• "Therefore, instead of being 37 wings short of our magical 143, we are, in fact, 49 wings short in airplanes. It is comforting that we are short only 37 wings in high ranking officers."

• "The situation is even more critical. All America would be shocked if it were really known just how few of these 94 wings are as much as two-thirds equipped with modern airplanes. We are astonishingly, shockingly far from our cherished 143 wings."

▶ **Hits Estimates**—He called attention to the inaccuracy of USAF spending estimates, or the failure to make buildup progress and meet spending schedules.

USAF's first estimate of 1953 fiscal year expenditures was $24.4 billion; by January of this year, USAF had scaled the estimate down to $15.4 billion, but the actual fiscal 1953 expenditure is now estimated at $14.6 billion—almost $10 billion below the initial estimate. (Wilson's restrictions account, at least in part, for low expenditures over the last four months of the fiscal year, February through June.)

"It shows grossly inefficient management, a totally undependable fiscal process, or deliberate misrepresentation," Welker declared. "It has to be one of the three."

▶ **Welker Challenge**—Since the Korean invasion in mid-1950, he said, "at least 10 Air Force production schedules have been approved or proposed. Not a single one of them has been met. Yet each year the civilian and military officials of the Air Force have insisted, 'Just wait until next year. . . . We will surely meet our schedule this time.' And, of course, every one of us did believe them. But the record remains one of failure. . . .

"We find that the blazing guns of the Air Force, while effective in rhetoric, tend to jam when they are trained on expenditures and aircraft production targets," Welker said. He then proceeded to challenge point-by-point proposals for additional funds in:

• **Personnel.** Welker commented on USAF's "remarkable flexibility" in estimates, pointing out that the service initially estimated a requirement for 1.9 million personnel for a 143-wing force and step by step scaled it down to 1,016,000.

• **Base construction.** A review of USAF's appropriations, obligations, and expenditures for base construction, Welker said, "all adds up to one simple fact. There has always been sufficient money available for Air Force construction. The only trouble has been that the Air Force crowd could not get it obligated and spent in time."

• **Operations and maintenance.** Recalling that last year Congress "took a terrible chance with national security and braved USAF charges of catastrophe consequences" by cutting the operations and maintenance allocation $800 million below the $4.4 billion budget estimate and allowing only $3.6 billion, Welker pointed out that USAF used only $3.2 billion for fiscal 1953. Fiscal 1954, he said, "administrated the wind and water out" and allowed $3.2 billion, "but of course we hear the same forecasts of doom."

• **Research and development.** After USAF found out they were "firing blanks" and "missing the target" with their arguments for more personnel, operations, and base construction money, Welker charged, "belatedly another run was made for research and development money."

Maintaining that much fat can be squeezed out of the USAF R & D program, he discredited these projects, which, he stated, are being financed out of appropriations to give us a fully modern Air Force: "Occupation Factors in Determining Suitability of Jobs for Women", "Survey of Aleutian Volcanoes", "Determination of the Principles Underlying Human Comfort", "Research on Vocational Interest of Air Force Officers."

Comet Din

- **Air committee's protest keeps jet out of Idlewild.**
- **Says public not ready for 'different noise.'**

The National Air Transport Coordinating Committee stood fast last week in its opposition to a landing by the Comet—or any other jet transport—at any civil airport in the New York area.

Prime target of that opposition was the Royal Canadian Air Force Comet that landed at Mitchel AFB on Long Island recently on its way back to Ottawa from Washington, after a flurry of protests steered it away from New York's International Airport (Idlewild).

►**Public's Reaction Feared**—Behind NATCC's attitude, say sources close to the committee, is its feeling that the public has not reached that magic point at which it will accept jet transport operation over residential areas as a commonplace part of modern living.

These sources were quick to discount speculation in some industry circles that the objection to the Comet landing stemmed from U. S. airline officials who wished to avoid public comparison with propeller-driven planes.

For more than a year, NATCC has been engaged in a strenuous program to abate aircraft noise and low flying in the vicinity of major civil airports near New York.

Because the program is geared to today's civil air transport piston engine operation only and not to the speedier jet transports, the committee asked the Comet, with its "different noise characteristics," to stay away from its door.

But to show its awareness of the other side of the problem, the committee has invited RCAF to suggest operating procedures under which its two Comets might be worked into the civil airport landing pattern. In the meantime, NATCC is adamant in wanting the Comet to operate from military fields such as Mitchel AFB or Floyd Bennett Field, in its role as a military plane.

►**Flight Background**—The committee heard in June that RCAF planned occasional visits to New York with its new Comets. First flight was made last month but did not land, it came from Ottawa, flew over New York and returned to Ottawa via Montreal.

On reports that another flight was planned, with landing at Idlewild, a Port of New York Authority official communicated with the Canadian consul general in New York, asked RCAF's intentions and explained that New York airports were closed to such flights. But he said he would be glad to discuss procedures. The word was relayed to Air Commodore R. C. Ripley at RCAF's station at Lachine, near Montreal.

Ripley sent a wire to Adm. C. E. Rosendahl, (Ret.), executive director of NATCC, expressing a desire to land the Comet at New York and giving the itinerary and purpose of the flight.

The purpose, he said, was two-fold—first, in the interests of joint security of the North American continent, and second, to transport Canadian chiefs of state and other personages to and from the U. S.

At subsequent meetings between committee and RCAF representatives, operating procedures were discussed, but without firm agreement.

►**C. R. Smith Letter**—U. S. State Department sources reveal that C. R. Smith, president of American Airlines and chairman of NATCC's executive committee, wrote a letter July 2 to R. Douglas Stuart, U. S. ambassador at Ottawa.

Stuart was asked to intercede with RCAF to prevent the Comet landing at Idlewild on grounds it was a military aircraft, although a transport, and that its operation into and out of the New York commercial field would jeopardize the committee's efforts to effect its noise abatement program.

NATCC, says the committee, "was deeply concerned over the possible adverse effects of having multi-jet-propelled transports with different noise characteristics and aspects operating into a New York civil airport at this critical trial period in its aircraft noise abatement program."

The flight began July 8—Ottawa-Washington National Airport-Mitchel AFB-Ottawa. It was to be completed the same day, but because of tire trouble at Mitchel, the plane returned to Ottawa July 9. The landing at Washington had CAA approval.

R7V-1 Crash

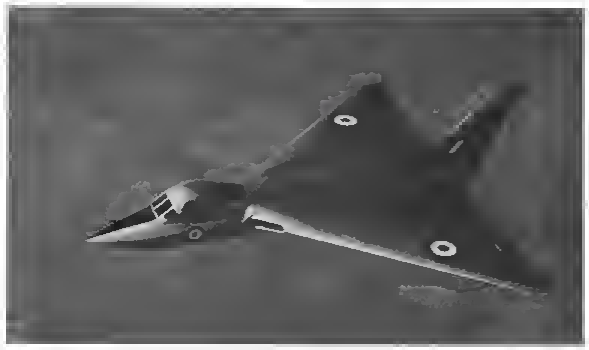
Investigation was proceeding secretly last week into the crash July 7 of a Turbo Compound engine R7V-1 in Maryland. Six Navy crewmen were killed. It was the first crash of a Turbo Compound powered plane.

Since the R7V-1 is a forerunner of a fleet of Turbo Compound-engine Super Constellations to be delivered to several airlines this year, both military and civil authorities are concerned.

Joining in the crash investigation are Lockheed, the manufacturer, Navy and Civil Aeronautics Board. Ervin Townsend, chief of the Technical Division, his assistant, John F. Pahl, and A. B. Hallman, engine and propeller specialist, represent CAB.

First CAB representative at the crash scene was Edward Slattery, public information officer. He flew over the scene with a professional photographer just 90 min. after the crash.

Tail section of the aircraft was located more than half a mile from the main impact point. The plane appeared to have gone in at a steep angle. Debris was concentrated within a small radius of the main impact point.



FIRST DELTA-WING TRAINER FLIES

First flight view shows new Avro 707C dual-control delta trainer, just taken off the British secret list. Notable change over the earlier 707A and 707B is the unusual cockpit canopy with circular side panels. The craft is powered by a single Rolls-Royce Derwent centrifugal-flow turbojet. It is designed to aid pilots in familiarization of delta-wing aircraft flying characteristics. Avro now has five deltas flying: Vulcan four-jet bomber, two high-speed 707As, one low speed 707B and the 707C.

Talbott's Stand

- **AF eefuses to reverse Kaiser cancelation.**
- **But labor wins company a chance to bid on C-123.**

Detroit labor leaders made a fist swinging, though futile, pitch at the Air Force last week as the final curtain was rung down on the Kaiser Motors Corp. C-119 contract cancelation.

Before the air had cleared in the Pentagon conference room, Air Force had had the last word. USAF had no intention of reversing its stand on the cancelation order. Unionists retired, a bit shaken, to repair their differences with Air Force Secretary Harold Talbott in the Secretary's office.

Nevertheless, labor won from Talbott the assurance that Kaiser would have equal chance to bid for production of the C-123 should the Chase Aircraft assault transport be built, a point still being debated between Army, which claims it needs a plane like the C-123, and Air Force.

►**Little Chance**—In his opening statement, Talbott said "if it (C-123) is built, it will not be manufactured at the Willow Run plant."

He later withdrew the statement after both the union leaders and congressmen present cried foul. But from the general tenor of Talbott's remarks, it could be seen that Kaiser had little chance of capturing another big plane contract because of its unhappy experience with the C-119 Flying Boxcar.

Secretary Talbott explained in the open conference requested by unionists that cancelation of Kaiser's C-119 contract came after long deliberation.

►**Studies Made**—"Prior to canceling this contract," he said, "I had several careful and thorough studies made by experts, both in Headquarters, United States Air Force and Air Materiel Command at Wright-Patterson Air Force Base. Not a single officer who studied this problem came to me with any recommendation other than one that the contract should be canceled."

Leading labor's argument for continuance of the contract at the Kaiser Willow Run Plant was Emil Mazey, secretary-treasurer of the United Auto Workers, CIO. He charged Talbott with "callous disregard" of the working man in the Detroit area. Approximately 10,000 are affected by the cancelation at Willow Run as Kaiser phases out production.

Talbott, flushing as he damned the accusation, exclaimed that he was as interested in the Detroit worker as any man. He pointed out his chief concern was in getting the most out of the production dollar.

TALBOTT: Only results count

►**Talbott Answers**—"Our studies," said Talbott of Kaiser's production, "did not indicate that Kaiser would be able to increase their efficiency of production so as to better the rate of delivery and we had some indications that the unit costs would be further increased." The company had built 55 C-119s at Willow Run when its contract was canceled.

"The Air Force is the buyer," he said. "We are interested only in a manufacturer meeting the terms of his contract in price and in time of delivery. That is our responsibility. We are not criticizing labor or management. We are basing our decision on results."

Unionist Mazey relentlessly argued various facets of the Kaiser production problem, referring again and again to the testimony brought out before Sen. Styles Bridges' Senate Armed Services Investigating Subcommittee. Secretary Talbott repeatedly reminded him that "all that is behind us now, Mr. Mazey."

►**Union Approach**—The Air Secretary assured him "there are no higher class mechanics, workman and artisans in the country than there are in the Detroit area. I have been associated with the business for many years, and I have never run into a better group than you find there."

Mazey attempted to connect Talbott's Kaiser cancelation decision to the Secretary's Auto-Lite affiliation (he was former director) and with Walter and Thomas Flood, officers of that firm, whose brother, Arthur, is now a vice president of Fairchild Engine & Airplane Corp.

(Fairchild, which developed the C-119 and has consistently objected to Kaiser's C-119 production, will continue producing the 88 remaining C-119s in the Air Force contract now that Kaiser is out of the picture.)

►**Demands Apology**—Talbott's reply to the Mazey charge was a demand for apology.

"I never knew the Flood brothers," he explained, "and I think your inference that I have been dishonest demands an immediate apology. If the President has seen fit to select me for this post, then I am no crook."

Mazey later apologized to Talbott's satisfaction.

"One thing I want to make clear," said Talbott, "is that I alone made the decision to cancel this contract. While it might have been simpler to ride out criticism on these contracts and permit it to continue, I consider it one of my duties as Secretary of the Air Force to get just as much out of every appropriated dollar as I possibly can for the defense of the country. This I owe to the taxpayer."

►**Lewis' Stand**—He explained that his decision came after conferring with his staff of experts, which includes Roger Lewis, Assistant Air Secretary (Materiel), who "has spent 20 years in aircraft production."

"And I was a union member," Lewis added for the union leader's benefit. He said he does not carry a union card now.

"Then you ought to be ashamed of yourself," Mazey countered.

Talks are continuing on the fate of the Chase C-123, but Air Force has maintained the Army isn't certain the C-123 would fit its needs.

Talbott revealed the Air Force was waiting for "some generals to return from Europe." Presumably Gens. Matthew Ridgway, new Army Chief of Staff, and Alfred Gruenther, NATO Chief of Staff, although he refused to put any names into the record. Both Ridgway and Gruenther arrived in Washington last week.

►**C-123 Canceled**—Cancelation of the

A-Engine Funds

Congress has approved $15.2 million for development of an atomic aircraft reactor, the amount recommended by the Administration. The Truman budget provided $22.6 million for the project. Last year $19.3 million was available.

The House and Senate also provided $15.1 million for development of a dual purpose reactor for propulsion of an aircraft carrier and generation of industrial power. AEC's first carrier reactor project was canceled as a result of a directive by Defense Secretary Wilson stating that it was not militarily justified.

C-123 contract at the same time Kaiser lost the C-119 June 24 was called for, Talbott said, because Chase and Kaiser, which owns 49% of Chase, failed "to come up with a solution to their management difficulties."

"The schedule for construction of the C-123 was approximately one year behind at the time of cancelation," he added. "In view of our schedule experience and price increases on the C-119, we had no reason to believe that schedules would be met nor that the unit costs of the C-123 would not show a continued rise. I am sure of this because the single C-123 contract could not possibly carry the overhead of the huge Willow Run plant."

Cost of opening the doors of Willow Run each day runs between $3.5 and $4 million.

► **Favors Detroit**—Talbott stated the C-119 and C-123 action does not necessarily mean the end of second source producers.

"The Air Force now has a total of $5 billion in contracts in the Central Procurement District," he said. "Over a billion dollars of this is in Detroit, and we fully intend to continue to place contracts where manufacturers have the know-how and the capability of meeting our schedules."

Representing Congress at the conference were Sens. Homer Ferguson, Charles E. Potter and Reps. George Meader and Charles G. Oakman, all of Michigan.

AD-4 Atomic Bombers In Carrier Service

Douglas AD-4B Skyraiders equipped to carry atomic bombs have been operating from carriers for nearly a year, the plane's designer, E. H. Heinemann, stated at the recent San Francisco Bay commemoration of the fiftieth anniversary of the Wright brothers' first flight. The announcement was cleared by the Department of Defense.

The Douglas engineer reported that the program to modify the AD-4 Skyraider to carry atomic weapons began in January 1951 and was completed in less than six months.

Looking forward to aviation's "third quarter," Heinemann predicts:

• **Extensive jet transport operations** by 1960, with limited service in effect in the next few years. Speeds will be 500 mph. by 1960 and 600 mph. by 1970, he estimates. Supersonic transports can be built to fly at 1,000 mph. at 35,000 ft., the designer notes, but intense heat from friction of the surrounding air may keep them from flying faster.

• **Aircraft atomic powerplants** will be the outstanding development of the next quarter century, Heinemann says, and atomic powered transports will be widely used in the last quarter century.

• **Rocket transportation** will be possible in the next 25 years, he states, but doubts whether it will be practical to meet the competition from conventionally powered airliners.

Heinemann dismisses "flying saucers" by noting that "I have not been able to determine one shred of evidence that would indicate that there is in actuality any abnormal vehicle, such as flying saucers, originating either from outer space or from the earth." (For story on Civil Aeronautics Administration study of 'saucer" phenomena, see p. 26.)

Airline Volume Up

Airline business last week appeared headed for a new all-time record. Passenger volume is up nearly 25% the first half of this year over last year's record (see p. 69).

Passenger business this year is running more than double that of 1950, up to the outbreak of the Korea war.

Air Transport Assn. reported that in the first five months this year domestic trunkline passenger-miles gained 24% from a year ago to 5.6 billion passenger-miles. International lines gained 17% to 1.3 billion passenger-miles.

Local service airline data, completed for the first quarter, showed their volume up 22%, and ATA indicated the trend seems steady since then.

Stratocruiser Ditching Procedure Under Fire

A controversy is brewing over the Civil Aeronautics Administration approved procedure to let Boeing Stratocruiser lounge passengers sit on the floor of the main cabin in the event of a ditching. Since seats in the lounge may be sold, there would be no seats available in the main cabin for lounge passengers were the airplane sold to capacity.

The Air Line Pilots Assn. feels the practice is unsafe. Nor does the Transport Workers Union, to which flight attendants belong, like the idea. Selling lounge seats leaves no suitable accommodations for the flight attendants, TWU says. The union protested this matter as long ago as August 1951.

Recently, letters have circulated within CAA making these points:

• **No time.** In event of a Boeing 377 having to ditch immediately after takeoff at airports adjacent to water, there would not be time for 14 passengers to evacuate the lounge via the narrow circular stairway and take their places on the floor of the main cabin. Records show that in the last four years, three four-engine aircraft have ditched close to airports with little or no warning.

• **No belt.** Section 4B358 (A) of Civil Air Regulations states that all passengers shall be afforded protection from head injuries by being provided with safety belts. It thus appears CAA is inconsistent in sanctioning evacuation of lounge passengers to sit on the floor of the main cabin where they are deprived of safety belt protection.

ALPA feels passengers seated in the main cabin would be endangered by the flying bodies of floor-seated passengers in the event of sudden deceleration caused by ditching.

The Chief Pilot's Office of Pan American World Airways in New York has informed AVIATION WEEK the carrier is studying provisions for seat-belt protection for passengers evacuated from the lounge.

NEWEST SWIFT FIGHTER MAKES DEBUT

Here is the latest version of the Supermarine Swift, the Mk. 4, which was shown to the public for the first time during the recent Paris Air Show (Aviation Week July 13, p. 16). It differs from the earlier Swift Mk. 1 in being fitted with a variable-exit afterburner, "flying" tail, dual wing fences and a modified wing leading edge with greater sweep at the inner portions. The supersonic RAF interceptor is powered by a Rolls-Royce Avon delivering 7,500 lb. thrust dry and 9,500 lb. using afterburner.

Air Base Cuts

- **House kills $400 million Wilson asked for 1954.**
- **New program is planned with money on hand.**

The Air Force took another in its succession of congressional spankings and defeats when the House Appropriations Committee turned down Defense Secretary Charles Wilson's request for $400 million in new money for USAF base construction over the 1954 fiscal year.

Wilson's $300 million reduction in the Truman recommendation of $700 million had been a major target of Gen. Hoyt Vandenberg's attack on USAF fund clipping. In not only refusing to restore the Wilson cut, but also turning down Wilson's $400-million recommendation, the House committee dealt USAF a double defeat.

► **Hits Planning**—After a review of the USAF air base financial picture, the powerful House group concluded "the Air Force construction programs presented to Congress for the 1952 and 1953 fiscal years were sadly deficient in planning and administrative direction. An agency charged with the utilization of a major portion of the defense funds of the nation thus destroyed the confidence of the committee."

The committee pointed out that USAF has $2.7 billion in unexpended funds to carry over into fiscal 1954. Of this amount, $1.8 billion is unobligated.

The group did give USAF the go-ahead on applying $240 million for explicitly specified new projects. But the financing for them would come out of USAF's unobligated balance, which presumably already is earmarked. In other words, the projects would be financed by a reallocation of funds.

► **New Projects**—Meanwhile, Defense Department submitted a $529 million Army-Navy-USAF fiscal 1954 public works program to Congress, stating that the projects proposed under it would be financed by money already on hand and that no new funds would be required. How the program is divided: USAF, $288 million; Army, $145 million; Navy, $96 million.

The new projects proposed in the Defense Department program and the House Appropriations Committee plan are not the same, although there is some overlapping. Both programs would involve a reallocation of USAF construction funds of about $528 million—the total of the $240 million House committee and the $288 million Defense Department plans.

The major expansions provided for in the Defense Department program are Little Rock, Ark., AFB, $14.2 million; Dover, Del., AFB, $19.7 million; Homestead, Fla., AFB, $13.3 million; Bunker Hill, Ind., Naval Air Station, $11.1 million; Plattsburg, N. Y., USAF barracks, $10.7 million; Arnold Engineering Development Center, Tenn., $10 million; Abilene, Tex., Municipal Airport, $15.9 million; USAF Aircraft Control and Warning System, $30.9 million.

► **Approved New Projects**—The $240 million in new USAF projects which the House Appropriations Committee stamped with approval are cut $172 million for overseas installations and $68 million for continental installations.

The overseas allocation includes: Alaskan Air Command, $13.1 million; Far Eastern Air Command, $22.4 million; Military Air Transport, $18.9 million; North Atlantic Treaty Organization, $50.5 million; Northeastern Air Command, $19.6 million.

The continental allocation includes: Air Defense Command, $1.9 million; Air Materiel Command, $14.3 million; Air Training Command, $6.9 million; Research and Development Command, $16 million; Strategic Air Command, $20.7 million; Tactical Air Command, $3.7 million.

CAB Approves Two New Interchanges

One-plane airline service from Pacific Northwest to Oklahoma and Texas will be provided for the first time, following CAB approval last week of interchange contracts between United Air Lines and Continental and Braniff.

Continental and United will exchange crews at Denver to give through service between Seattle/Portland on United's route and Wichita and Tulsa on Continental's route.

Braniff and United will exchange crews at Denver to provide one-plane service between Seattle/Portland on United's route and Colorado Springs, Oklahoma City and Fort Worth/Dallas on Braniff's route.

Since interchange contracts are not new route applications, CAB merely determines that they are not adverse to the public interest. The Board so found in these two opinions.

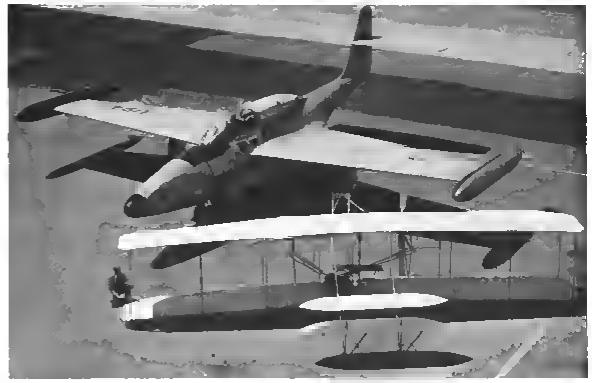
Horner in Europe

H. M. Horner, president of United Aircraft Corp., last week described his talks with officials of four German aviation companies as "purely exploratory."

The UAC chief said he conferred during a trip to West Germany last month with representatives of Junkers, Bosch, Daimler and Bayerische Motorenwerke (BMW).

Reports from Bonn say Horner studied the possibility of granting licenses to the firms for construction of engines, propellers and helicopters when West Germany's aviation industry is free to reorganize after ratification of the Allied peace treaties.

Before World War II, BMW built engines for the JU 52 transport under license from UAC's Pratt & Whitney Aircraft.



FIFTY YEARS OF PROGRESS

A full-scale non-flying replica of the Wright brothers' 1903 pusher poses in front of a two-seat Northrop F-89 Scorpion all-weather jet fighter, depicting the considerable advance in aviation during the past 50 years. Twenty-four aircraft firms cooperated in building the Wright pusher which is being placed on permanent display in the Institute of the Aeronautical Sciences' building, Los Angeles.

GROUND EXHIBITS like this Piasecki H-21 copter drew crowds at Detroit air show.

Detroit Air Show Draws 150,000

The nation's biggest air show—the Sixth International Aviation Exposition at Detroit—played a different theme this year: no racing, no stunting, no aerobatics.

Instead, the ground and air displays stressed aircraft capabilities, resulting in a constructive and educational exhibit that drew nearly 150,000 persons in four active days.

Exhibits included the first public showing of Chance Vought's guided missile, the Regulus. The military hinted of new things at hand or in the making.

Gen. Curtis LeMay, Strategic Air Command chief, and Gov. G. Mennen Williams unexpectedly attacked Air Force cutbacks at a dinner commemorating the 50th anniversary of powered flight.

▶ **Military Imprint**—Each service arm explored a different means of making an imprint on the public consciousness.

• **Air Force** culminated long distance B-36 and B-47 flights with landings on schedule at Wayne Major Airport and seven AF Korean aces flew a jet formation past the grandstand.

When one long-distance flight, a B-36 Strategic Air Command bomber, arrived from England, officials revealed it was equipped with a hitherto-unmentioned radar jamming device being used regularly in European practice missions. The bomber normally would lead a mission and jam enemy radar, so following ships could fly through a protective screen.

• **Army** staged a sham battle to show how aerial units help fight at the front line.

A helicopter detachment of the Army shuttled H-13s and H-19s between the field and downtown Detroit, where motorists and pedestrians jammed the streets around Memorial Park to watch the copters take off and land on the "Thin Dime Airport."

• **Navy** put on what some bystanders described as the most inherently interesting demonstration, simulated carrier landing procedure over a marked-off area.

▶ **730-Mph. Speed**—Fastest flight during the show came on the last day. A Navy F7U-3 Cutlass piloted by Cmdr. John Ryan streaked past the stand at time announced as 730 mph. Because of unofficial but definite rivalry between the services, Navy gradually had let out more speed on each flight.

Air Force speed was dramatized by switching the public address system into a jet's radio as the aircraft made a vertical climb. The crowd gasped as the pilot called off altitude at intervals of scant seconds—"12,000, 16,000, 18,000—"

▶ **Civilian Limelight**—Civil aircraft had a share of the limelight, dimmed somewhat by the flashing speed of military jets. During the four days of the show, there were fly-bys of the Beech Bonanza and Twin-Bonanza, Cessna 170, 180, and 195, de Havilland Dove, Meyers 145, and Bell helicopters.

Of the civilian ground exhibits an Eastern Air Lines Super Constellation attracted surprising interest. During the show's two heavy days—Saturday and Sunday—long, unbroken lines of spectators filed through the transport. Industry representatives, impressed by the interest in something many of them had considered humdrum, likely will try for broader exhibits of standard transports next time.

▶ **Military Display**—Navy fly-bys included the F7U-3, F9F-6 Cougar, FJ-2 Fury, and F2H-3 Banshee of today's complements. The World War II exhibit included these fighters: F8F Bearcat, F4U Corsair, F6F Hellcat and F7F Tigercat.

The AD Skyraider and F9F Panther also were operated.

Navy demonstrated drone flight and sent a P2V Neptune patrol bomber from the runway with Rato takeoff.

The Air Force brought out all its current variety. These included: F-84 Thunderjets in a formation Rato takeoff; the C-119 and C-124 cargo transports, F-89 Scorpion and F-94 Starfire all-weather fighter and F-80 Shooting Star, B-45 Tornado, XB-51, and B-47 Stratojet bombers.

Not the least of AF acts was a flyover of six B-36 bombers in formation one day, six B-47s on another.

Two refueling operations were conducted before the stands, a KC-97 tanker regassing a B-47 Stratojet and an F-86 Sabre jet.

On the ground, the services had samples of these and other ships.

• **Regulus** roped off in a shed under careful guard. Reports were that it would not be long before all security would be removed from this unit.

• **Bell X-5**, transonic research ship, was the subject of periodic explanations by an officer stationed with it.

▶ **Deep Concern**—At the 50th anniversary dinner, Gen. LeMay said Air Force cutbacks would have been simpler if the Defense Department had admitted it didn't have the money, rather than seeming to reinterpret its reports.

LeMay pointed out that it would take two or three years before budget slashes are felt.

The general added a laconic reference to former Defense Secretary Louis Johnson: "If something happens, C. E. Wilson will be in a position like another before him. If nothing happens, he'll be a hero."

Gov. Williams made a slashing attack on current military spending policies.

"We are entitled to view with deep concern the present national policy of reducing the planned air strength of the United States," he said. "Our national leaders assure us that we can have a stronger Air Force with fewer airplanes, that we can buy more air power for less money and that the judgment of civilian political appointees ought to be taken in preference to the judgment of military leaders who have the responsibility of defending our country against possible air attack.

"If we are taking a calculated risk in the hope of saving $5 billion, then let us have that fact out in the open."

Piasecki to Build H-16

Typographical error in AVIATION WEEK July 13, p. 25, moved Piasecki's H-16 copter into a competitor's plant. The H-16 will be built by Piasecki at its Morton, Pa., facility, and not a new Sikorsky factory now under construction.

Aimer Gets F-86 Bombs Closer

Seoul—Air Force has been trying out a bomb-aiming device in Korea that promises to increase accuracy of jet fighter bombers by more than 50%.

Definitely not a sight, the manual pip control is an adaptation to the automatic computing electronic gun sight. The modification is designed and produced by North American Aviation.

NAA sent a number of kits (tagged "black boxes" by pilots) to Korea with its veteran test pilot Bob Hoover and armament expert John Clover in mid-May. These technicians introduced kits to two fighter-bomber wings of F-86 Sabres after extensive tests in U. S.

►**Practice Makes Perfect**—Already burdened with a great number of controls and instruments to watch, some pilots were reluctant to accept adaptation. Now they like it.

"It improves their accuracy by more than 50%," says Hoover, who has flown Sabres on two fighter-bomber strikes in North Korea. "The pilots learned they could make more direct hits with it and get a lot closer on misses. It just took practice and getting used to."

Clover points out, however, that no exact data can be provided by try outs in combat, although pilots generally are "very happy" with the kit.

At present, 30% of each Sabre fighter-bomber wing is equipped with the kits. More are on the way.

On his arrival, Clover checked out ground crewmen on installation of the manual pip control. It takes about five hours to install one kit.

►**Easy Maintenance**—The system is so simple, Clover explained, that maintenance is no problem. There are two units in each kit but they are relatively inexpensive to produce and keep up.

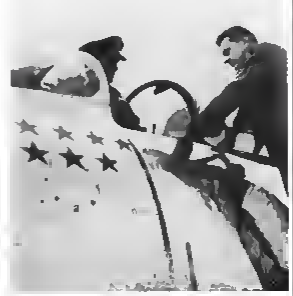
Although the black boxes are specifically adapted at present to North American's Sabres, they can be fitted with minor adjustments to other fighter-bomber types, NAA's representatives point out.

At the end of their five-week tour Clover and Hoover were to give reports to Gens. Weyland and Anderson of Far East Air Force and 5th AF. Then they were to return home with information for their company.

►**Advantages**—These appear to be advantages of the manual pip control:

• It allows the pilot early in the dive run to make fast manual adjustment in the sight for any changes in factors he estimated before peeling off. Electronic sight was often inefficient in adjusting at high speeds, pilots said.

• It gives the pilot a caged sight. Before the kit was installed, the pipper in the electronic sight sometimes disappeared entirely from pilot view when the jet swerved from pre-set run conditions to meet unforeseen factors, such as crowding by other aircraft. When the black box is attached, the electronic sight is in a fixed setting (caged) for the dive bomb function.



NAA TECHNICIAN briefs AF colonel on new dive bombing device installed in F-86s

By providing a means of establishing and adhering to computed factors for dive bombing, it simply gives high-speed dive bombers more latitude and accuracy.

Small mistakes in dive bombing result in serious errors. An uncompensated 10-deg. error in dive angle results in a bomb miss of about 180 feet; release altitude missed by 1,000 feet means a 100 foot miss on the target; air speed mistake of 20 knots results in a 60-foot bomb miss.

The kit gives a pilot about three seconds to correct the sight if his run begins at about 12,000 feet.

Electronic gun sight is very accurate in air-to-air work and rocketry without this modification and the kit does not function in these types of missions.

It is too early to report an evaluation. Reports will not be available for some time. But preliminary study indicates the black box will be highly favored by pilots of jet fighter bombers.

Reds Worry About Jap Air Revival

(McGraw Hill World News)

Official concern over revival of the Japanese aircraft industry is being expressed in the official Russian and Communist Chinese press.

Pravda, in a dispatch from Shanghai, notes that many Japanese companies are not only engaged in repairing planes for the U. S. Air Force but are working on experimental models of aircraft and engines. The Russian newspaper says

Navy's Korea Ace?

A Navy Corsair pilot flying for USAF is about to become Navy's first ace of the Korean war.

Lt Guy P Bordelon, Franklin, La, has shot down four Yak 18 single-engine Russian trainers in the past two weeks while on special assignment with Fifth Air Force. He needs but one more to be Navy's first ace.

The yaks have been dubbed "Bed Check Charlie," flying so slow that highspeed Allied jets can't keep the piston-powered planes in their sights long enough to knock them down. Thus Air Force called on the Navy for loan of a slower piston fighter to do the job.

Lt Bordelon has received two Silver Stars for his feat.

24 Japanese aircraft companies want to join in a huge aviation combine similar to the setup during World War II.

"The Japanese Nakajima firm was split into 12 separate companies after the war," Pravda continues. "But four of these Nakajima branches—Fuji Industrial, Fuji, Omiya Fuji and Tokyo Fuji—have reached agreement on consolidation. A Mitsubishi firm shortly after the war began working toward reunification of its aviation empire and at present is trying to establish closer ties with the Sumitomo propeller-making firm."

SEC Lists Convair Shift as Biggest Sale

Shift in control of Consolidated Vultee Aircraft Corp. from Atlas Corp. to General Dynamics Corp. was the biggest aviation stock transaction in May, Securities & Exchange Commission reports.

Atlas sold a 400,000-share block of Convair stock, largest single holding in a U. S. aircraft industry to General Dynamic (Aviation Week Apr. 6, p. 13). The major shift left Atlas Corp. with 30,300 common shares of Convair stock.

Other stock transactions in the monthly official summary include:

Air Associates: Doener Trusts, beneficial owners, bought 4,850 common shares, making total holdings at 44,840; William H. Foulk, director, bought 200 common shares increasing total holding to 500; Hillsboro Plantation Inc. beneficial owners, bought 100 common shares to make a total of 108,020.

Aro Equipment Corp.: L. L. Hawk officer, sold 1,476 common shares leaving a 1,028 total holding.

Avco Manufacturing Corp.: R. S. Pruitt, officer and director, sold 600 common shares, leaving a total holding of 20,678. James D. Shouse, officer and director, sold 2,000 common shares, leaving 3,580.

Boeing Airplane Co.: William M. Allen,

Ejection Seat Test

1 Vought technicians ready replica of F7U-3 cockpit to see results when canopy doesn't release prior to seat ejection.

2 Seat shoots up with canopy trailing downward. In actual flight, airstream would blow canopy free. Seat ascended nearly 60 ft.

3 Seat is lifted from nearby pool. Dummy will be examined for marks indicating injuries that might be sustained by live pilot.

president and director received 189 common shares compensation, giving him a total holding of 3,489; Wellwood E. Beall, senior vice president and director, received 197 common shares compensation, making a 892 total. Edward C. Wells, vice president-engineering, bought 198 common shares, making 573 total holding.

Fairchild Engine & Airplane Corp.: Richard S. Boulette, president and director, bought 100 common shares, making a total holdings of 900.

Lockheed Aircraft Corp.: K. V. Sampson, officer, bought 250 capital shares, making 276 total.

National Airlines: H. P. Foreman, officer and director, bought 300 common shares, making a total of 2,000.

Pacific Northern Airlines: Harold A. Olsen, officer, bought 900 common shares, making a 6,100 total holding; Robert A. Rowan, director, bought 100 common shares, making a total of 15,900.

Republic Aviation Corp.: J. W. Powell, director, sold 200 common shares, leaving a 2,000 total.

Trans World Airlines: Ralph S. Damon, president and director, sold 500 common shares, leaving a total holding of 3,139.

United Air Lines: R. E. Ahrens, vice president, sold 100 common shares, leaving a 852 total.

United Aircraft Products: Robert K. Hart, director, sold 100 common shares, leaving a 700 total holding; E. L. Ladd, officer and director, sold 1,500 common shares, leaving a 400 total.

Wrisco Air Lines: Robert E. Driscoll, director, bought 300 capital shares, making a total of 500.

Around the World In Ninety-Nine Hours

Using only scheduled airlines, Braniff International Airways' publicist Horace C. Boren has flown around the world in 99 hr. 16 min. Braniff claims it was the first such flight in less than 100 hr.

Boren's 21,000-mi. trip from New York and return bettered mark set last year by Jean Marie Audibert of France of 115 hr. 39 min. and the 119 hr. 47 min. flight made in 1949 by Maj. Thomas G. Lanphier, Jr., Convair vice president. In 1949, an Air Force Boeing B-50 circled the globe nonstop in approximately 94 hr., using four air-to-air refuelings.

Boren made the flight to publicize Braniff's 25th anniversary and the 50th anniversary of flight. Starting June 21, he used only three airlines and three planes to speed around the globe: a Trans World Airlines tourist-class Constellation from New York to London, a British Overseas Airways Comet jet liner from London to Tokyo and a Northwest Airlines' Stratocruiser from Tokyo to New York. The flight was made with 19 stops and was only two hours behind schedule.

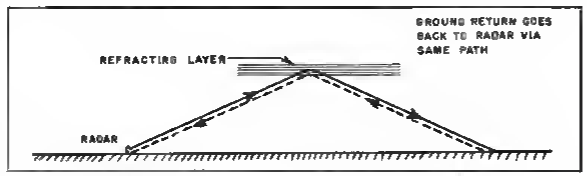
MSA Contract to Fiat

Rome—Fiat aircraft and engine manufacture of Turin, has received a $3.7 million loan from Mutual Security Agency to purchase machine tools and other special equipment in the U. S. These items are required to make an estimated $9 million worth of Allison J35 jet engine spare parts.

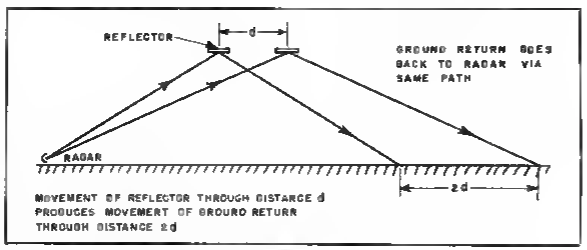
CAA Study of Unidentified Radar Plots Shows . . .

That Was No Saucer, That Was an Echo

- **Spurious radar targets laid to air refraction.**
- **Same thing may cause "flying saucer" mirages.**



TARGETS SHOW UP when radar energy is refracted by atmospheric layers.



TARGET MOVEMENT on radar scope is twice that of the refracting layer

A few minutes before eight o'clock on the evening of last Aug. 13, seven stationary targets suddenly appeared on the surveillance radar scope of the Washington Air Route Traffic Control center. Seconds later, a new batch of mysterious radar targets were sighted. Within a minute, four new targets appeared and started moving in a southerly direction.

Some newspaper headlines screamed that these mysterious sightings were "flying saucers." An extensive investigation by the Civil Aeronautics Administration has recently confirmed a more plausible and scientific explanation first advanced by Dr. Donald H. Menzel, professor of astrophysics at Harvard.

▶**Spurious "Saucers"**—CAA concludes that the spurious targets are caused by radar energy which ricochets off small atmospheric areas, strikes the ground, and returns an echo via the same path. These isolated refracting areas are normally found under temperature inversion conditions (when the air near the earth's surface is colder than the layer of air above it) and travel with the wind, giving moving target indications on radar scopes. The same phenomenon, similar to the cause of desert mirages, may be responsible for some of the visual sightings of "flying saucers."

These findings, and supporting data, are contained in a recent report entitled "A Preliminary Study of Unidentified Targets Observed on Air Traffic Control Radars (T. D. Report No. 180), by Richard C. Borden and Trey K. Vickers of CAA's Technical Development and Evaluation Center in Indianapolis. (Highlights of CAA's preliminary investigations were reported in AVIATION WEEK Dec. 29.)

▶**More at Stake Than Saucers**—CAA's investigation was motivated by more than an interest in possible interplanetary visitors that had failed to file required flight plans with the ARTC. There has been a growing use and acceptance of ground radar for air route and airport traffic control. The appearance of unidentified and unexplainable moving targets on radar scopes could well shake pilot confidence in the devices.

"The history of radar abounds with reports of strange echoes received from supposedly clear skies," the CAA report states. Birds or stray weather balloons were first suspected, but this didn't hold up. When spurious echoes were received in the dead of winter, the idea that they were caused by swarms of insects had to be abandoned."

Observers noted that spurious echoes were more numerous on summer nights under calm conditions and began to suspect some connection with the weather, the CAA report states. Additional evidence indicated that many of these echoes originated in the fine structures of the dielectric (refracting) layers of air-mass boundaries and in regions of air turbulence, the report adds.

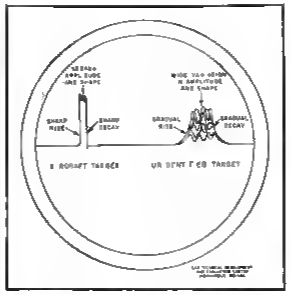
▶**Under Suspicion**—One of the first steps in the CAA investigation was to tabulate all reports over a three-month period of spurious radar targets sighted at the Washington ARTC center. Data on the number of targets, their location, altitude and time of sighting was included. Then CAA tabulated U.S. Weather Bureau meteorological data for the Washington area during the period of each sighting.

"It was then discovered that a temperature inversion had been indicated in almost every instance when the unidentified radar targets or visual objects had been reported," CAA says.

CAA investigators next checked with control tower operators at Atlanta, Boston, Chicago, Cleveland, Minneapolis and New York, to learn whether they had spotted unidentified targets on their surveillance radars. Chicago and Cleveland reported unidentified sightings on many occasions. Boston reported rare sightings; the others reported none. If interplanetary visitors were scouting the U.S., they apparently had no interest in New York, Minneapolis, and Atlanta.

▶**The Grease Pencil Points**—A study of grease pencil plots of unidentified target movements which Washington ARTC center personnel made during the night of Aug. 13-14 showed that all the targets were moving from a northwesterly direction. A study of prevailing winds for the same night, from the ground up to 33,000 ft., showed that they too were out of the northwest and west.

A similar analysis of grease-pencil plots of targets sighted on Aug. 15-16,



A-SCOPE picture shows difference between aircraft and "spurious" echoes.

and prevailing winds present in the area, showed that the unidentified targets and the prevailing winds were moving in the same general directions. This consistent direction of target movement eliminated the possibility that they were surface vehicles or transient aircraft and indicated that the targets whatever they were, were being carried by the winds. This suggested they might be reflections from clouds.

▶**Comparing Speeds**—CAA investigators decided to compare target speed with the velocity of prevailing winds to confirm their suspicion. Target velocity could be approximated from time interval notations on the grease pencil target plots. The velocity of prevailing winds was known, but these varied widely (zero to 84 mph) depending upon the altitude. The problem was to determine target altitude. This was difficult because surveillance radar merely shows the slant range (distance) to the target and not its altitude.

However, using the slant range indicated on the target plots, investigators were able to establish a maximum possible target altitude and "throw out" altitudes above this value. (For example, a target whose slant range is five nautical miles could not be above an altitude of 30,400 ft., even if it were directly overhead.)

▶**The Unexpected**—The case which the investigators were building was momentarily shattered when it was found that target velocities were much larger than those of the prevailing winds in the direction of target movement at estimated target altitude. In fact, target velocity was nearly always double the wind velocity. This double speed effect could be produced, the CAA investigators reasoned, if the radar beam were bouncing off a horizontal reflector which was being carried by the wind. The radar energy would then strike the ground and the ground return (echo) would in turn bounce off the reflector to the antenna.

Any horizontal movement of the re-

flector would produce an apparent target movement and velocity twice as great as the reflector movement and velocity by virtue of the principle that the angle of reflection is equal to the angle of incidence (see sketch, p 26).

►**End of the Trail**—If certain atmospheric conditions associated with temperature inversions could cause patches of air to act as a reflector refractor, the CAA sleuths were at the end of their trail.

Borden and Vickers think they have that explanation: dissimilar air masses moving at different speeds and headings at or near the inversion boundary set up eddies. These produce bulges in the inversion layer which act like a lens to concentrate and direct the radar energy. This not only deflects the radar beam to the ground but produces a strong enough echo to show up on the radar scope.

Borden and Vickers say that reports of sudden target accelerations to supersonic velocities were probably due to a target suddenly fading out and another appearing at a different spot on the radar scope. This would be explained easily by sudden dissipation of the refracting air eddies and the sudden creation of new ones in other areas under conditions of temperature inversion.

►**Other Causes Possible**—Borden and Vickers don't attribute all unidentified targets to temperature inversion eddies. They point out that small rain clouds, bird formations, and balloons may be responsible for occasional radar sightings.

They cite a report that more than 4,000 balloons are released every day by government and civil research organizations.

►**Effect on Air Safety**—The CAA report concludes that the spurious targets caused by air eddy refraction do not pose a problem to experienced radar controllers. The radar targets are generally weak and fuzzy which, coupled with their slow speed, serves to identify them as spurious targets.

The most dangerous possibility, the report concludes, is that one of these targets might be a helicopter, despite the fact that helicopters do very little instrument flying at the present time.

If the course of an unidentified fuzzy target is such that it could collide with an aircraft target, the radar controller should warn the aircraft pilot of the unidentified target, the report concludes. Pilots would rather be warned about a possible target, spurious or real, than risk not being warned of a real one.

►**Other Conclusions**—The rash of spurious targets in the Washington area last summer is thus explained on the basis of the unusual weather which caused frequent temperature inversions.

This same phenomenon, moreover, may be responsible for some of the visual sightings of "flying saucers," Borden and Vickers suspect (as does Dr. Menzel). These inversions can refract light in much the same way as they do radar energy, making it possible for an observer to see a bright light that is actually situated below his horizon.

On rare occasions, multiple images of the same object may be visible, the report says.

►**Recommendations**—Borden and Vickers suggest that ARTC centers and control towers equipped with surveillance radar make target plots and keep a log of all unidentified targets appearing on their radar scopes. They also suggest the use of an experimental tracking radar setup to enable investigators to follow closely the movement of spurious targets, and the use of an A-Scope radar presentation to provide more information on the characteristics of the unidentified target.

When helicopter traffic gets heavier and switches to instrument flying, Borden and Vickers think it will be desirable to equip surveillance radars with a device to detect helicopter rotor modulation of the radar beam. This would enable a radar controller to identify a target positively as either a helicopter or a reflection. —Philip Klass

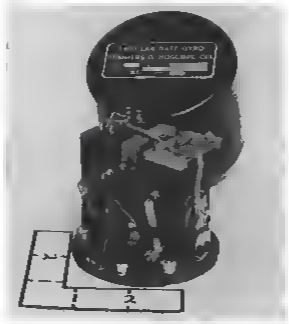
Miniature Gyros

Three manufacturers have recently announced that they are in production on miniature and sub-miniature rate gyros suitable for use in airplane autopilots, damper systems, fire control systems, and missile guidance. Here are details given by the manufacturers:

• **American Gyro Corp.** is producing floated type rate gyros weighing 0.6 to 0.7 lb., available with either a.c. or d.c. motors and/or pickoffs. Company says that flotation, which relieves 85 to 100% of the bearing loads, makes the gyros extremely rugged and well suited to missile use.

Gyros are available with any desired damping factor in the range of 0.2 to 1.2. Damping factor is maintained within 0.2 over the temperature range of —60F to 160F by means of a variable viscous-damping gap within the gyro, AGC says. Gyros are available for maximum angular rate measurements of 15 to 2,500 deg./sec. with undamped natural frequencies of 20 to 150 cps. American Gyro Corp., 1509 Colorado Ave., Santa Monica, Calif.

• **Sanders Associates, Inc.** New Model 7 in Sanders' series of sub-miniature rate gyros is less than 2 in. long, 1 in. in diameter, and weighs only 3 oz. Maximum linear signal output occurs at an angular rate of 420 deg./sec. and resolution is better than 0.05 deg./sec., Sanders says. Company says the unit is hermetically sealed, temperature compensated, and has an 85-cps. natural frequency with 0.5 damping factor. Motor speed is 24,000 rpm. It operates on 6.3 v., 400 cps. current. Sanders Assoc., Inc., 137 Canal St., Nashua, N. H.

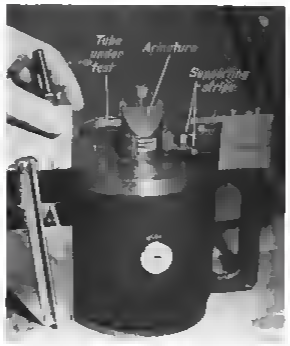


• **Summers Gyroscope Co.** Model 70 rate gyro weighs 1.25 lb. and is available for either d.c. or a.c. operation, with or without damping and hermetic sealing in a variety of sensitivities. Summers says the gyro is accurate to better than one percent and has a natural frequency approximately equal to the square root of the gyro's maximum angular rate (deg./sec.). Company says gyro has been qualified under military specifications environments. Summers Gyroscope Co., 2328 Broadway, Santa Monica, Calif.

Vibrator Puts High G-Loads on Tubes

National Bureau of Standards has developed a device capable of vibrating vacuum tubes over the unusually wide range of 100 to 10,000 cps. and producing up to 20G accelerations on the tube. The NBS vibrator should be useful in checking for spurious signals (microphonics) generated in a tube under vibration.

The checker operates on the same principle as a dynamic speaker. The tube under test is placed in a non-magnetic armature equipped with a "voice



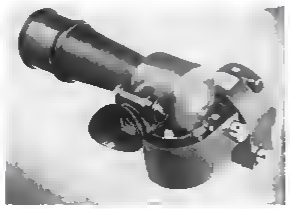
Vacuum Tube Vibrator

coil." The armature is suspended, cantilever style, from two flexible metal strips in an electromagnetic field structure powered by a 40-watt d.c. field coil. The "voice coil" is excited from an audio-frequency driving voltage at the desired vibration frequency.

NBS says the vibrator response is flat between 100 and 10,000 cps.

Radar Calibrator

Installation and proper calibration of radar antennas in aircraft is simplified with use of a new radar boresight telescope recently developed by Aremac Associates.



The company claims the scope is the only tool specifically engineered for this use. In addition to insuring correct initial calibration, it is designed to provide a fast, accurate means of checking radar antenna alignment periodically. Precision of the device is such that it can be used for making corrective determinations on radar equipment in research and development activities the firm says.

Built to military specifications, the scope is of elbow design and employs a 10-power prism-lens system of high instrument quality. Fifteen-power models also are made. Mount for the unit includes a precision, locking-type altitude-azimuth scale with a fine vernier adjustment.

Aremac Associates, 329 W. Washington St., Pasadena, Calif.

FILTER CENTER

▶**Gremlins in Navy Autopilot**—Navy has issued directive to disconnect temporarily all General Electric G-3 autopilots used in its F3Ds following reports from Marine Corps squadrons in Korea that autopilot mysteriously engages itself and puts airplane into unwanted flight attitudes. More recently, an F3D crash at takeoff was blamed on the autopilot despite the fact that the G-3 autopilot amplifier and controls were completely disconnected. Navy and General Electric are investigating the mysterious malfunctions.

▶**Aircraft Collision Prevention**—Cornell Aeronautical Lab is investigating the use of continuous-wave (CW) radar as a means of preventing collisions between aircraft or between aircraft and fixed objects.

▶**New British Autopilot**—Magnetic amplifiers have replaced vacuum tubes completely in a new British autopilot developed by Smiths Aircraft Instruments Ltd., London. The new autopilot, designated the S.E.P. 2, was recently demonstrated on a Viscount to Trans-Canada Air Lines. System weight, including auto-approach coupler and barometric altitude control, is reported to be slightly over 100 lb. Like its predecessor, the S.E.P. 1, the new autopilot uses three rate gyros instead of the commonly used directional and vertical gyro.

▶**Northwest to Buy Flight Directors**—Northwest Airlines has made provisions to install flight directors in its six new Lockheed Super Constellations now on order and will shortly begin a competitive evaluation of the Sperry Zero Reader and the Collins Radio Integrated Flight System. The Collins and Sperry equipment will be installed in separate Boeing Stratocruisers for evaluation tests.

—PK

One Sure Way to Get MORE DEFENSE FOR LESS MONEY

How can we get more national defense for less money? The best answer yet given to this question appears in a little-noticed section of the new defense budget. That answer, with which this editorial is concerned, is to provide more equipment with which to step up munitions production in an emergency. Thus we can eliminate much of the need to stockpile finished munitions in advance.

The new defense budget provides an appropriation of $500 million, to be invested by the Secretary of Defense in specialized facilities required to produce munitions on a wartime scale, but not adapted to profitable operation by private industry in normal times. Facilities of this type are known as "stand-by capacity."

There is no strictly political controversy over the "stand-by capacity" program. It was originally suggested by Clay Bedford, Special Assistant to the Secretary of Defense during the Truman administration. It has since been reviewed and endorsed by the Eisenhower administration. Moreover, it involves little or no technical controversy. Civilian and military experts are well agreed that the only alternative to enormous expenditures for stockpiling military equipment is to provide enough facilities for producing it quickly in an emergency.

Here is the Key Idea

In his speech of May 19, introducing his defense budget to Congress and the nation, President Eisenhower stressed the value of such reserve capacity in these terms, ***"The more swiftly and smoothly we can mobilize, the less our dependence upon costly standing armies and navies."***

In accord with this idea, the $500 million requested for the present reserve capacity program would be invested in tools that require a long time to produce, and so present grave complications in an emergency unless they are ready in advance. Some such tools would be installed in new plants that are needed to eliminate potential bottlenecks in the defense production program. Others would be ordered to replace that part of the government's present machine-tool inventory which is made obsolete by changes in the design of defense products. By completely "tooling up" with the most modern equipment, the admin-

istration hopes to realize a production potential many times greater than could be achieved by spending the same amount of money on military end-products.

Examples of Savings

In the specialized field of defense production, adequate modern capacity is the key to both economy and speedy delivery in a pinch. Here are some striking examples from the recent report of the Advisory Committee on Production Equipment (Vance Committee) to the Director of Defense Mobilization:*

—In the case of certain ammunition components, the cost of new capacity can be recovered in only six weeks of full production.

—If $500 million worth of special tools needed to make aircraft are purchased in advance, aircraft production during the first two years of war will be increased about $18 billion. In other words, it costs 1/36 as much to acquire the tools in advance as to acquire the aircraft.

—In the case of a certain ordnance item, an expenditure equal to the cost of only 150 units of the item will provide the capacity to produce thousands and save three years' time in meeting mobilization requirements.

Moreover, reserve plants and equipment can be kept up-to-date at only a small fraction of the cost required to maintain an up-to-date reserve of military end-products. The cost of replacing 5,000 obsolete tanks is at least $1 billion. The cost of new tools for a tank plant would be less than 10% of that amount.

*This Committee, headed by Mr Harold Vance, President of the Studebaker Corporation, included Clay Bedford, then President of Chase Aircraft, Manly Fleischman, former Defense Production Administrator, and several retired military leaders with wide experience in procurement

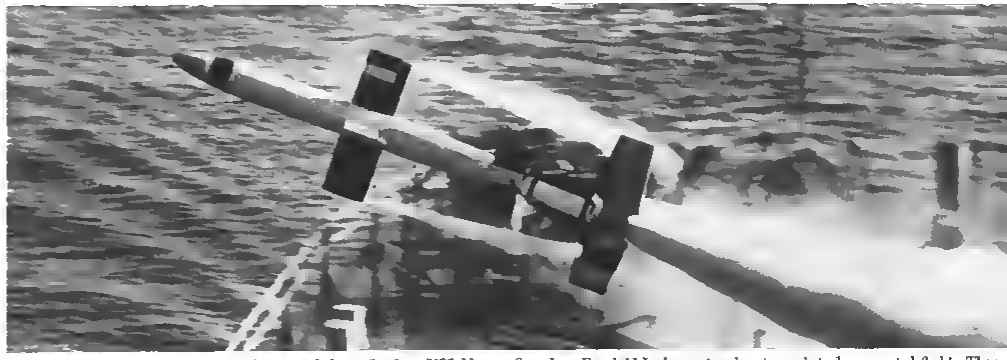
Savings Will Multiply

On the basis of facts like these, the Vance Committee recommended that the Defense Department spend $500 million to $800 million per year on specialized defense production facilities in order to provide substantial reserve capacity as soon as possible. It also recommended that expenditures for military end-products which get obsolete rapidly be held to a minimum. The Eisenhower administration has adopted this approach to the problem of munitions production in asking that $500 million be invested in reserve capacity.

The importance of this approach is much greater than is indicated by the amount of money to be spent on new tools, although this amount will go far toward assuring a healthy machine tool industry, adequate to meet emergency demands. ***What is really important is the great saving that can eventually be made in the cost of our defense program by a modern tooling program.*** If we are to maintain this program for a long period, and if we are to pay as we go, we must have a low-cost program. No other plan to reduce and control the cost of a garrison economy can compare with the new approach suggested in the Vance Report and now embodied in the new defense budget.

Congressmen will do well to scrutinize all military appropriations carefully. They have a chronic tendency to be too big. But there should be no penny-pinching on investments in capital equipment that will pay out in as short a time as six weeks in a war emergency. It would be tragic if this opportunity for real economy were lost in the controversy over other aspects of the defense program. ***The tooling program is a key part of the Eisenhower effort to cut defense costs. It should be promptly approved.***

McGraw-Hill Publishing Company, Inc.



LAUNCHED from U. S. Navy guided missile ship, USS Norton Sound, a Fairchild Lark uses two booster rockets during initial flight. They will be jettisoned and the Lark will continue flying on thrust of its liquid rocket motors

First Closeups of Fairchild Lark

SPECIFICATIONS

(Approximate)

Main Wings

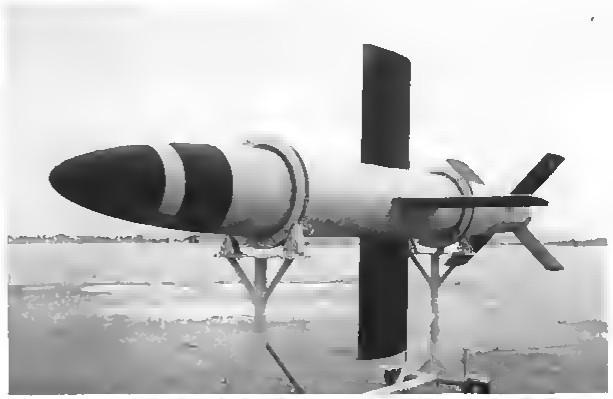
Tip-to-tip span	6 ft. 3 in.
Root-to-tip span	2 ft. 4 in.
Chord	1 ft. 9 in.
Aileron span	2 ft. 2 in.
Aileron chord	5 in.

Tail Surfaces

Tip-to-tip span	4 ft.
Root-to-tip span	1 ft. 5½ in.
Chord	1 ft. 3½ in.
Ruddervator span	1 ft. 1⅝ in.
Ruddervator chord	3⅛ in.

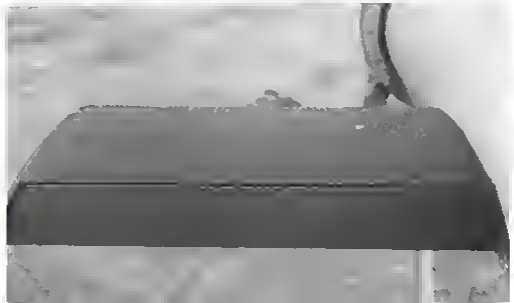
Fuselage

Overall length	13 ft. 11 in.
Diameter	1 ft. 6 in.

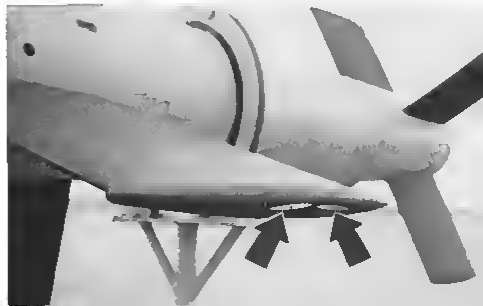


LARK configuration is detailed in this view taken while missile was on public display. It was developed as an anti Kamikaze weapon near the end of World War II.

AILERON on Lark's port main horizontal wing. All four of the missile's wings are fitted with these ailerons



EXTENSIBLE stabilizers (arrows) on vertical wings only (here tilted 90 deg.), are activated by rate gyros.



Titanium Lab Opens At Mallory-Sharon

A new laboratory devoted exclusively to research and development on titanium and its alloys has been opened by Mallory-Sharon Titanium Corp., Niles, Ohio.

The lab will handle work formerly done by the company at P. R. Mallory & Co.'s Indianapolis plant.

The lab set up includes a facility for chemical work, metallographic and spectrophis section, mills for hot rolling test specimens, furnaces for treating and melting, an X-ray diffraction unit and the usual lab test equipment.

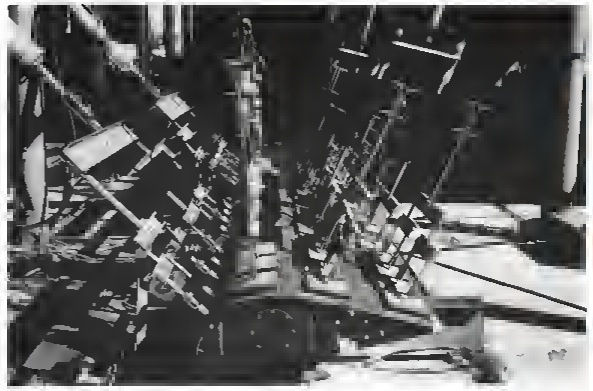
Another new Mallory-Sharon development is a melting process reported to produce ingots with "superior characteristics to anything presently known." Claimed to combine the best features of arc and induction melting, the process is said to produce ingots displaying the same characteristics throughout. Ingots of a given type are reproducible, and size and shape can be varied over a wide range.

Carbon content, it is claimed, can be controlled exactly to any amount specified and held as low as the amount inherent in the titanium sponge.

The process affords a marked increase in yield, it is reported.

SOUND CLEANING

Intense high-frequency sound waves produced by a General Electric ultrasonic generator are being used in a solvent bath to clean jet engine fuel control parts manufactured by Holley Carburetor Co., Detroit. Holley's quality control personnel are reported to have demonstrated efficiency of procedure by applying it to several parts already cleaned by the brush-scrub and flush method. Filtered solvent from the subsequent ultrasonic cleaning showed a significant amount of additional dirt, GE reports.



RUBBER TENSION pads follow curves of wing during stress tests at Consolidated Vultee Aircraft's San Diego Div.

New Pads Simplify Stress Tests

Convair's rubber tension layouts conform to angles of pull during simulation of loads on plane structures.

Rubber tension pads make it possible to test stresses on aircraft structures at Consolidated Vultee Aircraft Corp. without altering the parts that are being tested.

One side of the tension pad is cemented to an aluminum or mild steel back plate; the other is bonded to the test specimen. Previous methods involved the drilling of holes in the specimen for the attachment of spokes and clips, or the use of clamps, or the piling of sandbags on the structure to simulate operating loads.

▶ How Pad Acts—Data prepared for AVIATION WEEK by Convair's test engineer A. R. Vollmecke reveals that the pads conform to various angles of pull and allow a uniform distribution of the load which can very closely approxi

JACK CONNECTORS apply operational loads to a wing surface through many tension pads fitted to the plane structure.

mate actual aerodynamic forces

The pads in no way reinforce the test structure and readily conform to buckles incurred during proving

▶ **Standard Unit**—The standard pad fails at the ultimate tensile strength of the rubber—about 65 psi. The working allowable strength, for safety reasons, is held between 10-15 psi., Vollmecke says. Each standard pad in a loading layout is capable of safely transmitting 250-375 lb. to the test structure.

This pad assembly consists of a ball joint and a 24ST aluminum backing plate (12.5 X 4.8 X 4.8 in.) bonded to ¾-in. sponge rubber filler with Flintkote 974 neoprene cement.

The standard pad and back can be cut to a smaller size or shape on a bandsaw. It can be bent to any desired contour, and the filler pad sliced or notched to fit over irregular surfaces.

▶ **Special Pads**—For loads up to 2,500 lb. a special high-tension pad can be used, Vollmecke reports. This special unit has a tensile ultimate of approximately 100 psi. It consists of a mild-steel backing plate (1.875 X 4.8 X 4.8 in.), loading lug, and a ¼-in. sheet rubber filler. Shell Chemical's Epon No. 6 is used as the adhesive.

Completed tension pad assemblies can be stored in cartons until required. Standard pad storage life, Vollmecke says, is approximately eight months, while the Epon-adhesive pad can be stored indefinitely.

BLOCKS apply pressure for pad bonding

PADS conform to buckled structure surface.

▶ **Testing**—Each of the standard tension pads in a pad layout is proof tested to 20 psi. (500 lb.) by using an air cylinder with a regulating valve, mounted on a mobile tripod stand.

If a pad begins to peel or fail during a proof test, the assembly can be salvaged—the rubber is sliced off close to the test surface. The thin layer of rubber remaining on the specimen is soaked with solvent and removed with a fiber scraper.

Boeing Trainees Make Use of Scrap

Employe trainees at Boeing Airplane Co.'s Seattle plant are getting practical experience and producing usable articles at the same time.

The company's training plan main-

Valve Talk

for WM. R. WHITTAKER CO., Ltd.

by Marvin Miles,
Senior Member, Aviation Writers Assn

They're known formally as specifications, but everyone calls them "specs." You hear the word used frequently around a plant such as the Wm. R. Whittaker Co., Ltd.

Specs are "statements of desirable effect," against which valves are created to perform the myriad tasks that valves must accomplish in aircraft. The experts who write them for the major companies are vital indeed to the vendor.

I'd never thought too much about specs until we got into a bull session the other day. Then I learned just how important they are.

Generally, they originate in the airframe design engineering departments. An engineer wants a valve to do a certain job. He knows how much space he has for it, what pressures and flows and actuating speeds he wants, and he sends the info to the specification department.

There the basic information is tied into military requirements and any other specs that might be applicable to valves on the particular aircraft involved—with sometimes 50 or more references to previously established specs on everything from finishes to workmanship.

Then valve companies like Whittaker are asked to study pages and pages of description and references liberally laced with the phrase "to be in accordance with . . ."

Whether or not they bid for the business depends on the job itself, on the time and cost of the project, and most important—on the functional requirements.

This, of course, is but a general idea of the spec operation. Actually there are endless variations. The specs from one company may include only envelope size, basic requirements, desired quality and functional testing. Another may add to these a multitude of other requirements such as special envelope shape, port locations, electrical connections, etc., all detailed in a specification control drawing.

Newest wrinkle in the field is for a major to specify only the basic effects desired and then to ask the valve companies to submit proposals that can be checked competitively against an itemized list of installation and functional requirements. The company with the biggest overall score wins the business and their performance requirements are used in writing the specs.

I might add here that Whittaker welcomes such competition. If a company can produce, it should have no fear of matching its capabilities against those of any other company.

On many occasions Whittaker's field engineers work with the primes in building specs. Frequently time and money can be saved through such cooperation for these men know just what can or can't be expected from a valve. Perhaps a valve already exists that will fill the bill with minor modifications. Perhaps critical fingertip data can be supplied, deficiencies avoided, expensive unnecessary changes eliminated.

Test procedures evolve in the same manner now and then. A major company finds that the rigors of Whittaker test are ample—many times more severe than originally envisioned—and accepts them as the ultimate spec requirement for the valve under consideration.

Yet there's always give-and-take in the spec operation. I doubt if any unit ever built conformed in minute detail to every demand. There are such things as deviations.

The primes are under ever-increasing pressure for performance, naturally, and it follows that they must ask "reach" performance of their vendors. Hence their requirements are frequently steep—too steep from time to time—but this they realize and when an impossibility crops up and a deviation is requested, they're understanding and cooperative.

Whittaker engineers have nothing but praise for the specifications people in the big plants. They believe that writing specifications should rank with one of the toughest jobs in an Engineering Department. Unfortunately, too many people don't appreciate this work. The prime contractors themselves work under Government specifications. By writing specifications which thoroughly define the requirements of a given unit, the prime contractor, in turn, is furnishing a document which can eliminate those misunderstandings with their vendors that would later prove tragic in a high production program.

Whittaker men consider a good set of specs as the first blueprint to top production . . . a sort of two-way benefit with both Whittaker and the prime on the receiving end.

tains interest, matches production problems to articles which would otherwise have to be purchased, and salvages considerable material from the company's scrap pile.

Last year, more than 53 different kinds of metal products were turned out by the trainees—a total of 11,395 items for use in Boeing's offices and shops. Products included wastebaskets, wire reels, file dividers, letter files, dust pans and a lunch cart. The articles are stocked in various departments and are obtainable throughout the plant without charge on order from a catalog.

Special articles are made on request if they meet the training school's requirements.

Stretch-Form Press Used in Aluminum Jobs

A new stretch form press, developed by Longren Aircraft Co., Torrance, Calif., does a variety of high-production jobs on aluminum alloy sheet and extrusions.

Taking part of its name from veteran engineer Albin K. Peterson, who designed it, the Longren-Peterson multiaction machine is reported to offer many advantages. These include low cost, simple construction and installation, use of little floor space, high flexibility of operation, and need for few operating personnel. The press requires as little as two minutes to load, form and unload after setup is made, it is said.

Operating at 2,000-3,000 psi., the single-action hydraulic system incorporates two vertical and two horizontal cylinders and a center main ram cylinder. These can be used in combination or separately to give the machine high flexibility in forming.

The two horizontal cylinders, with 30-in. stroke, are located in the sides of the base. They move the chuck support plates horizontally to accommodate parts from 6 in. to 30 ft. in length.

(Continued on page 50)

SINCLAIR SALUTES THE GREAT SILVER FLEET...

ON ITS SILVER ANNIVERSARY

25th ANNIVERSARY
Experience Inspires Confidence
EASTERN AIR LINES

This year, Eastern Airlines passed its quarter-century mark of steadily-expanding service. Last year, for example, the Great Silver Fleet transported some 4 million passengers and averaged 170,000 miles a day over its network of air highways.

One important reason for Eastern's position in the Aviation industry is the fact that they test — *and select the finest products available.* Sinclair is proud that this year, again, Eastern has chosen to use Sinclair Aircraft Oil exclusively. *Today, more than 45% of the oil used by major scheduled airlines in the U. S. is supplied by Sinclair.* Why don't you place your confidence in Sinclair Aircraft Oil?

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AUGUST 17, 1953

AVIATION WEEK

THE USAF "AIR RESEARCH AND DEVELOPMENT COMMAND" EDITION

Including a Special Report on **"AVIONICS IN THE AIR FORCE"**

On Aug. 17, 1953 Aviation Week Editors will publish the story of ARDC—Nerve Center of Research and Development. Included in the issue will be a full-scale Special Report titled, "Avionics in the Air Force." This Edition approved and prepared in cooperation with the Air Research and Development Command, offers unmatched editorial values, thus presenting Aviation Manufacturers and Suppliers with an outstanding opportunity to advertise their products and services to the Industry. Aviation Week Editors working in teams have compiled a running story of Research and Development in the Air Force, a moving, powerful picture of the organization and mission of the nine major Centers within the ARDC. As usual, this Aviation Week Edition will set new standards of editorial presentation and dwarf in size all other publishing assignments of this nature.

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(continued from page 44)

The two vertical cylinders, with 24-in. stroke, move the gripper jaws either vertically or horizontally. The center main ram cylinder, with an 18-in. stroke, moves the die vertically.

Rated at 100 tons, the press stretch forms aluminum alloy is the S-W condition up to 3 sq. in. in cross-sectional area and 72 in. wide. Extrusions or sheets up to 16 ft. in length and extrusions up to 6 in. in width can be contour-formed.

Forming dies are made of steel, high density wood, plastic, plaster or Mechanite. A drawing compound of vegetable and mineral oil lubricates up to 5,000 psi.

Longren will manufacture a limited number of these presses to order.

PRODUCTION BRIEFING

▶ **Corn Electric Co.**, Stamford, Conn., has acquired International Connector Corp., Paterson, N. J., and after transferring its facilities to Stamford will operate the new section as Gorn Electronics, a division of Gorn Electric Co.

▶ **Canadair Ltd.**, Montreal, is releasing approximately 1,500 employees following cancelation of the work Canadair was to do on the terminated Beech T-36.

▶ **Bell Aircraft Corp.**, Wheatfield, N. Y., is adding 10,000 sq. ft. to its foundry.

▶ **Parker Aircraft Co.**, Los Angeles, has acquired Proof Industries' entire line of aircraft hydraulic directional control valves and the firm's backlog of approximately $1 million. The acquisition will be known as the Proof Division of Parker Aircraft Co. and will continue to operate at its present site, 10000 Exposition Blvd., Los Angeles.

▶ **Ansupply Co.**, a division of the Barrett Corp., has taken new quarters with 10,000 sq. ft. of floor space at 9815 Wilshire Blvd., Beverly Hills, Calif.

▶ **Solar Aircraft Co.**, San Diego, Calif., has received a contract from North American Aviation, Inc., for several hundred Solaramic (ceramic-coated) exhaust systems for installation on T-28B trainers. Contract is valued at more than $200,000.

▶ **Engineering Research Associates**, a division of Remington Rand, Inc., St. Paul, has leased space in the Midway Terminal Warehouse Building, 2295 University Ave., St. Paul. The firm will use the additional area to expand development and production of electronic computers and precision instruments.

Navy Contracts

The following contracts were announced recently by the Navy's Aviation Supply Office, 700 Robbins Ave., Philadelphia 11.

Engineering & Research Corp., Riverdale, Md., amplifier assy., 121 ea., $38,739.

Scintilla Magneto Div., Bendix Aviation Corp., Sherman Ave., Sidney, N. Y., maintenance parts for various aircraft engines, $43,421.

Shielding, Inc., Norman Ave., P. O. Box 917, Riverside, N. J., cell-type screen room, 20 ea., $46,892.

Turco Products, 6135 Fairmount Ave., Philadelphia, cleaning compound, $68,405.

Breeze Corps Inc., 41 S. 8th St., Newark 7, N. J., amplifiers, $68,108.

Andrew Brown Co., 6421 District Blvd., Los Angeles 22, lacquer, 12,884 gal., $26,174.

Grimes Mfg. Co., 615 N. Russell St., Urbana, Ohio, light parts, $68,148.

New York Air Brake Co., Watertown, N. Y., hydraulic pump assy. for F9F-6 -8P, -7 aircraft, 1,031 ea., $128,767.

Piasecki Helicopter Corp., 100 Woodland Ave., Morton, Pa., maintenance parts for HRP and HVP aircraft, $144,245.

Solar Aircraft Co., 2200 Pacific Highway, San Diego 12, parts for T38M aircraft, $75,781.

W. B. Whittaker Co. Ltd., 810 N. Citrus Ave., Los Angeles, hydraulic valve, 80 ea., $33,300.

Aero Supply Mfg. Co., 811 Main St., Corry, Pa., stem assys., $37,571.

Airborne Accessories Corp., 1424 Chestnut Ave., Hillside 5, N. J., maintenance parts used on actuators for various aircraft, $32,214.

AiResearch Mfg. Co., 6601-6651 Sepulveda Blvd., Los Angeles 45, valve assy., 387 ea., $108,598; spare parts for R6D-1 aircraft, $361,301.

American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, plug receptacles, $40,020.

Collins Radio Co., 855 35th St. N. E., Cedar Rapids, Iowa, crystal unit, 1,500 ea., $41,250.

Continental Aviation & Eng. Corp., 1500 Algonquin Ave., Detroit 14, maintenance parts for various aircraft engines, $217,000.

Gavod Radio Corp., 70 Washington St., Brooklyn 1, N. Y., radar test sets, 70 ea., $121,604; $28,881.

General Development Corp., Box 270, Elkton, Md., spares for ZP2M airship program, $111,833.

Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles, actuators for TV-2 aircraft, 245 ea., $125,820.

Herman Elec. Mfg. Co., 170 N. Diamond St., Mansfield, Ohio, relay, 8,210 ea., $84,725.

Hewlett Packard Co., 395 Page Mill Rd., Palo Alto, Calif., generators, $40,447.

Holley Carburetor Co., 5930 Vanscoyoc Ave., Detroit 4, parts for use on J48P8 engines, $258,736.

B. M. Hollingshead Corp., 840 Cooper St., Camden, N. J., hydraulic fluid, 89,464 gal., $188,077.

Interstate Engr. Corp., 2280 E. Imperial Highway, El Segundo, Calif., valve, 300 ea., $40,629.

Joy Mfg. Corp., 4230 Clayton Ave., St. Louis, cable assys., $37,082.

Kaehler Aircraft Products Co., Inc., 814 Vermont Ave., Dayton 4, valve assys., $36,783.

Lockheed Aircraft Corp., PO Box 551, Burbank, Calif., maintenance parts for P2V aircraft, $20,842.

Monowatt Dept. of General Electric Co., 98 Hathway St., Providence 7, R. I., plug receptacles, $28,147.

Pan American World Airways System, 28-19 Bridge Plaza North, Long Island 1, N. Y., blades, $29,281.

Peirce Wire Recorder Corp., c/o Sunbran Co., 1126 Vermont Ave. N. W., Washington 5, D. C., recorder-reproducer, 70 ea., $41,801.

Permutit Co., 330 W. 42nd St., New York 36, kit, desalting sea water, 4,438 ea., $82,634.

Pesco Products Div., Borg-Warner Corp., 24700 N. Miles Rd., Bedford, Ohio, hydrau-

Messerschmitt Revival

Germany's most successful wartime designer of fighter aircraft—Prof. Willy Messerschmitt—is preparing to re-enter the aircraft business.

He plans to build a factory at Essen on property optioned from the Krupp combine. Germans see the famed professor's entrance into postwar aviation as a sign that the country's aircraft industry soon may be revived.

Messerschmitt has opened an office in Madrid and is known to be selecting a staff of experienced aircraft technicians, a report of the Transportation, Communications and Utilities Div., of the U. S. Commerce Department reveals.

Since the war, the designer has been building pre-fabricated houses.

llc pump assembly, 200 each, $25,177.

Knickerbocker Products Corp, Nicoll St. & Mitchell Dr., New Haven 4, Conn., watertight cable, $251,933.

Simmonds Aerocessories, Inc., 105 White Plains Rd., Tarrytown, N. Y., controls for R6D-1 aircraft, 30 ea., $87,330.

Superdraulic Corp., 19227 W. 7 Mile Rd., Detroit 19, chargers, $70,575.

Thickol Corp., 780 N. Clinton Ave., Trenton, N. J., polymer powder, $120,970.

Vorcraft Works, Inc., Keim and Cross Sts., Pottstown, Pa., enamel, 30,000 gal., $82,200.

Barber-Colman Co., Rockford, Ill., actuators, trays & box controls, $71,278.

Bendix Products Div., Bendix Aviation Corp., 401 Bendix Dr., South Bend, Ind., filter assy., 8,153 each, $38,962.

BeoBix Radio Div., Bendix Aviation Corp., E. Joppa Rd., Towson, Md., dial assy. used in C-143A/ARN-6 control, 420 each, $29,123.

A. Biedermann Aircraft Instr. Service, 1045 Airway, Glendale 1, Calif., services and material for overhaul of indicators, 380 each, $28,010.

Buckeye Tools Corp., 23 West Apple St., Dayton 1, pneumatic portable drill, 610 each, $27,650.

Champion Spark Plug Co., 900 Upton Ave., Toledo 1, spark plug, 70,000 each, $105,150.

Douglas Aircraft Co., Inc., El Segundo, Calif., stabilizer assy. for AD aircraft, 17 each, $129,580.

Douglas Aircraft Co., 3000 Ocean Park Blvd., Santa Monica, Calif., maintenance parts for R5D aircraft, $47,670.

General Electric Co., Lamp Div., 3201 Walnut St., Philadelphia 4, lamps, $25,964.

Glass Fibers Inc., 1810 Madison Ave., Toledo 2, glass fibers, 365,700 lb., $740,129.

Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif., signal generator, 102 each, $200,736.

Holley Carburetor Co., 5030 Vancouver Ave., Detroit 4, spare parts for P&WA engines, $253,895.

Industrial Hard Chrome Finishing Co., 6751 Hollis St., Emeryville, Calif., services and material, 2,161 items, $84,950; services & material, 3,109 items, $115,955.

Ingersoll-Rand Co., 3007 Chestnut St., Philadelphia 3, spare parts for use on compressor R11-C, $34,685.

Kollsman Instrument Corp., 80-08 45th Ave., Elmhurst, N. Y., maintenance parts for amplifiers, $83,785.

Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids, Mich., shafts, actuators, and screwjacks for various aircraft, $30,691; spares for shafts, actuators, screwjacks, $52,381.

Pacific Div., Bendix Aviation Corp., 11600 Sherman Way, N. Hollywood, Calif., hydraulic accumulators for various aircraft, $31,688.

USAF Contracts

Following is a list of recent USAF contracts announced by Air Materiel Command.

Bachman Wholesale Co., Box 237, Rochester, N. Y., meter assy., 533 ea., gear-RS 100 ea., dome assy., 49 ea., $94,540.

Cornelius Co., 560 80th Ave., N. E., Minneapolis, spare parts for airplane air compressors, $180,300.

Walter Kidde & Co., Inc., 675 Main St., Belleville, N. J., container, fire extinguisher, 930 ea., 272 ea., maintenance data, $70,974.

Michigan Brass Co., 500 S. Water St., Grand Haven, Mich., manifold, 1,418 ea., 1,100 ea., 1,201 ea., $28,133.

San Chief Electric, Inc., 41 Meadow Ave., Winsted, Conn., pitot tube, 6,700 ea., $97,104.

Universal Enterprises, Inc., 132 Nassau St., New York, fan assy., brush assy., 171 ea., 32,262 ea., $40,250.

Allison Div., General Motors Corp., Indianapolis, turbojet engines, 2 ea., $92,000; turbojet engines, spare parts, maintenance tools and training parts, $50,216,802.

Bell Aircraft Corp., Ft. Worth, handbooks, preserving, packing & crating, $48,845.

Bendix Products Div., Bendix Aviation Corp., South Bend, Ind., carburetors, spare carburetors and spare parts, $1,224,861; wheel assys., 370 ea., brake assys., 428 ea., spare parts and data, $542,882.

Bendix Products Div., Bendix Aviation Corp., South Bend, Ind., wheel assy., nose, 72 ea., 217 ea., wheel assembly, 70 ea., $47,270.

Chicago Aerial Survey Co., 332 S. Michigan Ave., Chicago, aircraft camera magazines, spares and test equipment and data, 886 ea., $489,140.

Crosley Div., Avco Mfg. Corp., Cincinnati, receivers, 2,533 ea., mountings, 2,485 ea., $905,806.

Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J., indicator, 862 ea., $40,314.

Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J., generators, 849 ea., $393,810.

General Scientific Corp., 5151 W. 65th St., Chicago, lens, 100 ea., $94,578.

Graflex, Inc., 154 Clarissa St., Rochester, N. Y., bed camera, 288 ea., body camera, 280 ea., leg, tripod, 332 ea., $70,855.

Kollsman Instrument Corp., 80-08 45th Ave., Elmhurst, N. Y., true airspeed indicator, 1,288 ea., computer and transmitter, 141 ea., amplifier, 143 ea., $342,607; airspeed indicators, special tools, 2,416 ea., $810,220.

Lear, Inc., 110 Ionia Ave., N. W., Grand Rapids, Mich., spare parts and data, 82 ea., $78,972.

Lenz Laboratories, Inc., R. D. #1, Wayne, N. J., tube, electron, 1,000 ea., 1,250 ea., 2,895 ea., $277,981.

Titeflex, Inc., 500 Frelinghuysen Ave., Newark, N. J., lead, 2,154 ea., 6,154 ea., $92,650.

Airborne Accessories Corp., 1414 Chestnut Ave., Hillside, N. J., gear valve control, 334 ea., 32 ea., 305 ea., $27,144.

Airsearch Mfg. Co., Div. of Garrett Corp., 9851 Sepulveda Blvd., Los Angeles, actuators, thermostats, and shaft assemblies, $240,140.

American-La France-Foamite Corp., Elmira, N. Y., valve, directional, 930 ea., $60,708.

Coreco Beaurath Corp., 1908 Broadway, New York, Coreco #300, 24 ea., spare parts, $68,978.

General Electric Co., 1 River Rd., Schenectady, N. Y., indicator, tachometer, electric, 2,017 ea., $195,870; mod kits, $35,441.

Grimes Mfg. Co., Urbana, Ohio, control unit, cockpit light, 14,720 ea., $76,627.

Great Lakes Mfg. Corp., Hammond, Ind., Plexiglas canopy assys., $67,413.

Jack & Heintz Inc., Cleveland, actuator assembly, 420 ea., 90 ea., 480 ea., $350,730.

Lincoln Industries, Inc., Marion, Va., B-29, Rudome, $194,850.

Liquidometer Corp., Skillman Ave., 36th

& 37th Sts, Long Island City, N Y, transmitter position, 1,221 ea., $28,230; tank unit, fuel gauge, 182 ea., indicator, electric fuel gauge, 36 ea., 191 ea., $20,062.

Magnavox Co, 2131 Bueter Rd, Fort Wayne, Ind, radio compass, 3,909 ea., $3,959,830.

A J. Miller Co, Bellefountaine, Ohio, modification kit, 1,515 ea., $42,177.

Ged Bank Div, Bendix Aviation Corp, Eatontown, N J, inverter assembly, 90 ea., 480 ea., $137,093.

Geneve Instrument Corp, 215 E 91st St, New York, servo type analyzer, 2 ea., electronic multiplier, 2 ea., generator, 2 ea., $133,966.

Sperry Gyroscope Co, Sperry Corp, Great Neck, L I, N Y, transmission error compensators, 410 ea., $137,849.

Steiner Plastics Mfg Co, Inc, Pratt Oval Glen Cove, L I, N Y, dome, navigators observing type, 924 ea., 935 ea., $73,499.

U S Gauge Div, American Machine & Metals Inc, Sellersville, Pa., indicator-pressure, manifold, 168 ea., transmitter-pressure, manifold, 453 ea., $48,297, gauge, hyde pressure, 4,203 ea., $31,473.

Weston Electrical Instr Inc, 614 Freylinghuysen Ave, Newark, N J, indicator, thermocouple, 3,145 ea., spare parts, $211,-537.

Aircraft Engine Div, Ford Motor Co, 7401 S Cicero Ave, Chicago, spare parts for engines training parts, $11,152,400.

McDonnell Aircraft Corp, Box 516, St. Louis 3, Mo, spare parts for FH-1 and F2H-1 aircraft, $89,049.

Measurements Corp, Boonton, N J, signal generator, 41 each, $28,108.

Engineering Research Associates, Remington Rand, 1902 W Minnehaha Ave, St. Paul, directional gyro indicator, 1,856 ea., spare parts, 84 ea., data, $2,947,825.

Wright Aeronautical Div, Curtiss Wright Corp, Wood-Ridge, N J, reconditioning of R3350 aircraft engine cylinders, 10,000 ea., $1,782,700.

LETTERS

French GCA Firm

Referring to your editorial, "How to Publicize Your Company," we would like to draw your attention to the fact that, to the best of our knowledge, CFTH is, outside the United States, the only firm presently manufacturing GCA precision approach radar in any quantity.

This equipment, although following closely CAA specifications, is of original design. Field performances in airports covering most of Western Europe (Belgium, Holland, Denmark, Italy, France) are reportedly good, especially from the point of view of reliability and cost of maintenance.

At the Amsterdam Schiphol Airport, CFTH working in cooperation with the Dutch Civil Aviation Administration, has set up a PAR installation which is believed to be unique, the radar being mounted in a remote-controlled rotatable structure and being thus able to serve two different runways.

E. Grigonis
Assistant Sales Manager
Compagnie Francaise Thomson Houston
173 Blvd. Haussmann
Paris, France

Disillusioned Engineer

Bravo to D. G. for putting his finger on the source and cause of the "engineer shortage" (AVIATION WEEK June 8). As a practicing engineer in the "war baby," the aviation industry, I'm sick of seeing clouds in the sky, recruiting posters designed to attract the uninitated neophyte to the engineering field or seducing the college graduate with offers of big pay checks, unlimited futures, and diversified activities.

In some ways, the current approach to job pirating and engineer stockpiling in the aviation industry is directly parallel to the military establishments which support us.

No one will deny that there is a shortage of engineering manhours in the industry hours desperately needed to keep us in the forefront of aviation progress, but the approach to the problem is not just more people but less boondoggling and less of the "brawn without brains" approach to the engineering problems.

We engineers in aviation are rightfully called the "gypsies of the profession", we have to be, for one day it's work on the project and the next it's canceled. Our pay may be high in the rush of defense, and non existent in the day of peace. Small wonder many of us look longingly for stability and a future without the pseudo glamor we read about but never seem to find in our special little specialties.

We are called a profession, but we are a unique one. Dedicated as a teacher must be dedicated, underpaid in relation to other professions and organized labor forces, criticized for our single-purposeness and lack of humanitarian instincts, in some ways an engineer is without honor in his own company.

Trapped by industry agreements or the

draft board, the young engineer finds disillusionment instead of enchantment, insecurity instead of security, and little opportunity to escape the channel into which his talents are voided by a management which screams when its waste is discovered and groans when the subsidy demands efficiency.

Sour grapes? Maybe, but there are plenty of others in the same boat. Figures show that currently as many are leaving as are entering the engineering field. Congratulations to both segments on their courage.

My advice to the young man about to enter an engineering school, or who is about to leave it: Think it over, talk with some of the five- and 10-year men, and don't be misled by the soft talk and big words of recruiting hordes. In the long run, the college degree is only the beginning of your training, in aviation it may be the end.

R. L. D.

Methods Engineering

Let's Trade!!! You publish all or a portion of this letter publicizing our firm, and we'll forget that you ignored us in your article in the Apr. 13 AVIATION WEEK describing the Methods Engineer training program at Republic Aviation Corp.

The instructors in that program were Mechaneers Inc. employes selected from a group of 23 Mechaneers employes doing methods engineering and tool planning at Republic.

A major portion of this training course was also developed by our employes. The training of tool planners, process engineers, and tool designers is one of the many services to the aircraft industry performed by our company.

To our knowledge there is not a single airplane and very few helicopters in production in the United States on which our firm has not done either processing, tool design, or tool building for either the prime contractor or the engine manufacturer. Additionally, we are working on many new ships about to be put into production, both military and commercial.

Our customers include Sikorsky Aircraft, Republic Aviation, Grumman Aircraft Engineering Corp., Cessna Aircraft, Piper Aircraft, Chase Aircraft, Avco Mfg. Co., General Electric Co., Allis-Chalmers Mfg. Co., and numerous others.

The unique (to our knowledge, we are the only firm that does this) feature of our services that we believe is newsworthy, is our policy of guarantee and financial responsibility.

To remove the "blank-check intangibility" from subcontract programs for tool engineering and tool building, we have a standard policy of maintaining full financial responsibility on all jobs that we design. For example, when we design an aircraft assembly jig and the customer then has it built either in our shop, his own shop, or at another vendor, we pick up the check for the cost of any rework due to design errors. Additionally, on all of the hundreds of aircraft assembly jigs and inspection masters, form blocks, and aircraft tools of all types that we build, we produce parts from them prior to delivery of the tools that must pass the customer's inspection before the tools are delivered.

We prefer doing all of these designing and

tool building programs on a flat bid basis and have proven, through much experience, that we can successfully perform complete package programs of design and building of all the tools for major aircraft assemblies and subassemblies

We operate two airplanes of our own and with their constant use have overcome the problems of distance. We are located on the Bridgeport Municipal Airport a few hundred feet from where Chance Vought employed 21,000 employes on aircraft production before their move to Texas. Naturally, this gives us an exceptionally unusual aircraft labor market and numerous of our employes have had from 15 to 25 years in the aircraft business

A point of interest to you might be that our highly successful sales program has been based on direct mail letters sent to the people listed under your "Who's Where" column and in various articles in your AVIATION WEEK magazine. This direct mail, together with a small advertisement appearing in your publication and in your associated publication, Business Week, has been responsible for multi-million-dollar sales

Frankly, we figure that the best usage of our services can be made by companies having our employes operate training programs such as the one that was operated at Republic. On programs of that type, it is possible for the thorough knowledge of aircraft production and tooling to be implanted into the minds of young and ambitious trainees, thereby helping to alleviate critical shortage of trained technical personnel

To be in with your complete coverage in the aircraft field, we would suggest that it may be of interest to you personally or possibly as an article for your readers, to make a study of a firm such as ours to compare the efficiency of production of a subcontract supplier specializing in certain phases of aircraft work as against the efficiency of the larger firms who do all phases of it

We have proven to our own satisfaction that we can usually perform a tooling program for somewhere between a half to a quarter of the cost that it takes a prime manufacturer to do it. For example, on one recent model plane, we designed more than 80% of all the tools, jigs, fixtures, and assembly jigs with approximately half of the tool designers that the prime contractor had to use to do the remaining 20%, showing a produced hour efficiency ratio of approximately 8 to 1. Though this may be quite a bit higher than average, it is our contention that tooling in this age of specialization can more economically be handled by a company specializing in tooling and tooling alone.

JOHN A. FAINE, President
Mechaneers Inc
Bridgeport, Conn.

Praise

We saw your writeup by Alex McSurely of the Foundation Committee Meeting of the 1953 survey Report in a recent issue of AVIATION WEEK. This is up to your usual high standard, and we appreciate your very complete coverage of the subject.

R. W. WOODHAM, Administrator
The Daniel and Florence Guggenheim Aviation Safety Center at Cornell University
2 E. 64th St.
New York 21, N. Y.

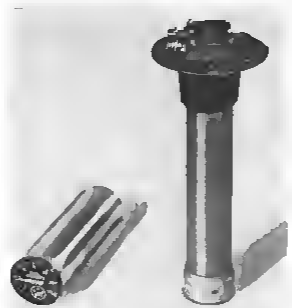
We are all delighted with the article you did on the Safe Flight Landing Speed Indicator (May 25, p. 67). It was a very clear, concise description of a subject which can get very complicated.

WILLIAM D. STROHMEIER,
Vice President
Davis-Parsons, Inc.
52 Vanderbilt Ave.
New York 17, N. Y.

"So you want to switch to days, eh? Just how long have you been on nights, Wrigley?"

Republic Aviation News

NEW AVIATION PRODUCTS



Fuel Gaging System Uses Fewer Units

Production of a new electronic fuel gaging system, said to be the first to employ only two components and to be 50% lighter in weight than other systems available, has been announced by Avien-Knickerbocker, Inc.

Designed primarily for military aircraft, the system (a capacitance type) includes only an indicator case and fuel tank probe. Separate boxes containing bridge circuits and amplifier have been eliminated, these elements being included within the indicator case. This not only reduces the number of components but eliminates all installation adjustments, the company says.

The equipment can supply information to other fuel control components, and ties in with a complete system of fuel management (produced by the firm) which automatically controls sequence of fuel transfer and computes and corrects center of gravity unbalances caused by transfer.

The components can be stocked like nuts and bolts for the particular plane and installed almost as easily, the firm says. All calibrating, different for each plane, is done at the factory. The equipment, in effect, is tailor-made for the particular application, with an accuracy of ½ of one percent claimed for specific tanks in specific craft.

This results in high interchangeability between aircraft of the same type, and an indicator case can be replaced almost as easily as replacing a lightbulb, the company says.

The two-unit system was evolved from equipment, first produced in 1948, which included four components. The amplifier and bridge circuit each had their own boxes. This eventually was compressed to three units, with amplifier and bridge circuit in a single box, then to two-unit version in production.

In the earlier equipment, the amplifier and bridge circuits were universal components for all craft, the probe and indicator were specialized. This necessitated extensive adjustment of the bridge and amplifier elements to meet needs of a particular plane.

These sets are said to have logged more than one million operational hours.

The company, which started production about 3½ years ago, is now one of the biggest producers of capacitance fuel gages. Sales are running around $5 million annually, Avien-Knickerbocker reports.

The company's address: 58-15 Northern Blvd., Queens, L. I., N. Y.

Jet Blade Gage

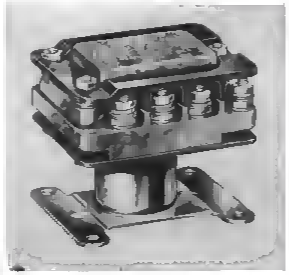
Unskilled operators can check several different critical dimensions simultaneously on gas turbine bucket blades using a gaging device developed by Sheffield Corp.

With the multiple gaging assembly—a blade positioning fixture having seven Plunjet gaging cartridges—and viewing the test results on a single-focus seven-tube Precisionaire unit, the operator reportedly can inspect:

- Blade length in relation to root form along the leading and trailing edges.
- Length of the root form.

Relative position of the Plunjet at the root form and those along the one edge of the blade is always the same since the gaging cartridges are set in a floating arm. Thus, according to Sheffield, any variation in root length, so long as it is within tolerance, does not prevent accurate inspection of taper. Dimensional accuracies are indicated by float indicators in the Precisionaire. A calibrated blade is used to position the floats, eliminating the need for expensive master gages, the maker says.

Sheffield Corp., Dayton 1, Ohio

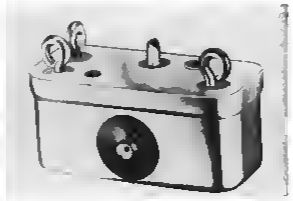


A.C.-D.C. Relay

Combination a.c.-d.c. dual-purpose relay for use in 3 phase 400-cycle power systems on motors, electrically heated windshields and other aircraft applications is designed to meet high shock, vibration, acceleration, altitude and temperature requirements, according to the manufacturer, Leach Relay Co.

Weight is 0.92 lb and dimensions are length, 3¹⁄₁₆-in., height, 2¾-in., width, 2¹⁄₁₆-in. The relay, designated Part 9071, is designed to be moisture- and dust-resistant and has contact and terminal barriered construction for arc resistance. Base is all metal.

Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif.



Sealed Snap Switch

New line of hermetically sealed precision snap switches stated to have a minimum life of 100,000 operations and requiring a low work force to operate is being offered by Haydon Switch Co.

Resistive ratings from 0-50,000 ft. include 28-v. d.c., 10 amp.; 110-v. a.c., 10 amp., from 60 cycles to 400 cycles, says the maker.

One-piece heavy-duty beryllium-copper switch blade with pure silver contacts welded into position provides good electrical and thermal conductivity and increases contact life, it is stated. Solder-type terminals, accommodating two No. 20 stranded wires are hermetically sealed and the hermetic enclosure reportedly withstands 100 psi internal pressure.

Haydon Switch Co., 232 No. Elm St., Waterbury, Conn.

Elapsed Time Device

An elapsed time indicator meeting standard 2¼ in. JAN instrument panel specifications and designed to keep a record of hours and tenths of hours has been placed on the market by Marion Electrical Instrument Co.

The device is hermetically sealed against humidity and temperature. The motor will start at −55F. It will register ⅒-hr. steps to 9999.9 or hour steps to 99999.0. The indicator can be used wherever it is necessary to record maintenance time, cycling and other applications.

Marion Electrical Instrument Co., Manchester, N. H.

ALSO ON THE MARKET

Strippable coating CD Strip 100 for protecting aluminum, glass, phenolic laminates and other surfaces during fabrication is supplied as a solvent solution applied by dipping, brushing, or spraying. It is water-soluble. Bright red color permits easy identification of sections treated. It can also be used for making spray booths or protecting them.—Chemical Development Corp., Danvers, Mass.

Sprayable plastic waterproofing coating conforming to MIL-B 12121 is available in olive drab, strato blue and service yellow, matching colors of military vehicles so that it need not be removed. It has been noted that storage life of tires sprayed with new coating is double.—Industrial Division, R. M. Hollings head Corp., 840 Cooper St., Camden 2, N. J.

New 35-ton hydraulic jack has patented automatic air vent which eliminates 90% of "air-lock" difficulty, according to manufacturer. Single pump with longer stroke gives more rapid lift with less pumping motion, usual fluid leaking point is eliminated and there is no air vent set screw to open or close during jack operation. Weight is 55 lb.—Duff Norton Mfg. Co., Pittsburgh, Pa.

WHAT'S NEW

New Books

Fifty Years of Flight, 1903-1953, by Welman A Shrader Published by Eaton Mfg Co, Cleveland 10, Ohio, 178 pages including index of illustrations, 600 photos, price $5.

In 1948, Eaton Mfg Co published the Chronicle of the Aviation Industry in America, 1903-1947 for its friends in aviation This was followed by supplements keeping the story up to date The supply of these profusely illustrated publications could not keep pace with the demand

Thanks are due Eaton for having combined the original Chronicle and the succeeding supplements into one book and making them again available to aviation enthusiasts It is the best year by year chronology of American aviation history in print The photo selection is excellent and the annual summaries of aviation firms, many of whom have long since vanished, makes fascinating study

It is readily apparent that author Welman A. Shrader, director of publications for the Institute of the Aeronautical Sciences, went "all-out" in putting Fifty Years of Flight together

The Aircraft Commander in Commercial Air Transportation, by Dr M S. Kamminga, 184 pages including bibliography and index, published by Martinus Nijhoff, The Hague, Netherlands Price $2 63

The rapid development of international air transportation has left the airline pilot's legal status far behind, although numerous conventions have wrestled with the delicate and complex problems Presently, as commander of a small airborne community, the pilot comes under various jurisdictions during a relatively short time, each of which define his responsibilities in a different fashion.

The author, in this interesting publication, obviously has spent considerable time in assembling his source material He has gone even further by making suggestions for a legal convention clarifying the commander's status It is unfortunate for the average reader that in several places the original foreign language is used to report the respective countries' viewpoints on pilot responsibilities —EJB

New Publications

Gas Turbine Engine Control is being distributed by Pratt & Whitney Aircraft Division, United Aircraft Corp., E Hartford, 8, Conn., for insertion in the company's Manual of Gas Turbine Operations

Currency conversion booklet, wallet-size covering 20 European and Middle Eastern countries, is available from Pan American World Airways, 135 E 42 St New York 17, N Y

Proposed Standards on Aircraft Hangars is 47-page booklet containing constructive suggestions by the National Fire Protection Assn Price 50 cents Write NFPA at 60 Batterymarch St, Boston 10, Mass

Jet Horizons gives a broad, non-technical story on jet propulsion and its possible effects on future aircraft, timed to coincide with the celebration this year of the 50th anniversary of flight Available from General Electric Co., Schenectady 5, N Y

Engineering—A Creative Profession briefly covers the interesting facets of this field as a career. It is intended to advise youngsters how to get started and provide them with information on the various types of engineering specialties Price is 25 cents Write Engineer's Council for Professional Development, 29 33 W 39 St, New York 18, N Y

Piper Gives Wings to Business is new manual being issued by the company to its sales force providing numerous case histories and data on the economics of operating Piper aircraft.

ASTM Manual of Engine Test Methods for Rating Fuels, Second Edition This 360 page volume incorporates all changes in the five standard methods for rating aviation, motor and Diesel fuels The new volume has an extensive index Price $8 Write American Society for Testing Materials, 1916 Race St, Phila, 3, Pa

Telling the Market

Maintenance and modification facilities of Meteor Air Transport, Inc., on planes up to transport size, are given in folder being sent out by the firm. Address Teterboro Air Terminal, N. J.

Selection of proper stainless steel is aided by reference data provided in technical booklet being distributed by Allegheny Ludlum Steel Corp., Public Relations Dept., Pittsburgh 22, Pa

Users of drill templates in the metal working industry are shown how to make inexpensive lightweight drill tooling in new Anchor Bushing Catalog, second edition Write Hi-Shear Rivet Tool Co., 8924 Bellanca Ave., Los

Angeles 45, Calif. The firm is also offering, Riveting With Hi-Shears, third edition, a training aid

Products and facilities of Advance Gear & Machine Corp., Los Angeles, Calif., are detailed in Gears and Gear Products, a brochure which also briefly tells how each type gear is cut and how gears are used

Plastics compounding and extruding service available from Conneaut Rubber & Plastics Co., Tallmadge, Ohio, are covered in Bulletin CR 53

Savings in production, maintenance and salvage by use of proper welding techniques are shown in 19 min. sound color film being loaned out by Eutectic Welding Alloys Corp. Write in care of Dept. P, 172 St. and Northern Blvd., Flushing, New York

Importance of proper alignment when cutting screw threads and how misalignment may be checked is contained in bulletin available from the Eastern Machine Screw Corp., New Haven 6, Conn.

Ideas Into Dollars is brochure describing research facilities covering mechanical, electrical, electronic, chemical or bacteriological problems available to industry by Commonwealth Engineering Co. of Ohio, 1771 Spring field St., Dayton

Preventing product contamination by using nickel plating where economics do not justify use of solid alloy or clad metal is detailed in bulletin available from International Nickel Co., 67 Wall St., New York 5, N. Y. Basic and detailed data on electroplating and its practices and keyed bibliography of further source material are contained in Bulletin 77 which also is available

Properties of Titanium and Titanium Alloys is booklet providing current information on different production methods, general properties of various alloys, standard production classifications and testing procedures and specific qualities of five types of titanium and its alloys. Write Mallory-Sharon Titanium Corp., Niles, Ohio

New methods and processes for custom molding of variety of rubber parts are given in Bulletin 5201A available from Rubber Products Division of Parker Appliances Co., Cleveland, Ohio

Broaching Practice is 80-page book aimed at production engineers and shop men reflecting 25 yr. of experience by National Broach & Machine Co., Detroit, Mich. Write on letterhead

X-Ray analysis of material specimens is clarified in booklet, Twenty Questions and Answers on X-Ray Analysis, being distributed by Research & Control Instruments Division, North American Philips Co., Inc., 750 South Fulton Ave., Mt. Vernon, N. Y.

Sand casting in magnesium and aluminum by the Osbrink process is depicted in a color movie which can be loaned from R. H. Osbrink Mfg. Co., 6917 McKinley Ave., Los Angeles 1, Calif., Attention of C. H. Butler.

High-temperature alloy questions are answered in non-technical style in article in Bolt News, Vol. 18, No. 2, available from Miss Delphine Byrne, advertising manager, H. M. Harper Co., 8251 Lehigh Ave., Morton Grove, Illinois.

Informational handbook on aluminum sheet and plate, including considerable technical data, is available from Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.

R3Y RIVETER

Extrusions for Consolidated Vultee Aircraft Corp.'s R3Y Tradewind flying boats are drilled, countersunk and riveted on General Drivmatic machine equipped with work table stretching 100 ft. Assembly moves on chain-driven rolls while machine installs rivets at 17 per minute. Drivmatic holds parts together with sufficient pressure so that it is not necessary to burr or clean out chips between surfaces. Company's San Diego Division also is using a Drivmatic to speed riveting of skin-stringer assemblies for Convair Liner 340.

FINANCIAL

Trunkline Revenues and Income

(Includes Domestic and Foreign Operations)

CARRIER	TOTAL OPERATING REVENUES[1]		NET OPERATING INCOME OR (DEFICIT)	
	1953	1952	1953	1952
	(000 omitted)			
American	$61,380	$54,294	$6,607	$4,200
Braniff	12,959	8,367	(928)	(456)
Capital	17,554	14,150	532	(844)
Chicago & Southern[2]	4,648	5,864	291	650
Colonial	2,680	1,815	66	(311)
Continental	3,803	3,148	48	112
Delta—C & S[3]	10,678	9,290	1,640	1,783
Eastern	65,196	60,216	10,171	5,381
National	14,503	11,295	3,105	2,552
Northwest[2]	22,563	19,275	(929)	(2,884)
Northeast[2]	2,514	2,102	(295)	(361)
TWA	45,390	43,540	439	335
United	51,508	44,531	2,011	3,782
Western	8,958	5,497	308	636
TOTAL	$319,812	$284,378	$24,184	$13,895

[1] Four months ended Apr. 30.
[2] Five months ended May 31.
[3] Merged May 1, 1953. Figures include four months for Delta separately and quarter ended Mar. 31 for Chicago & Southern separately.
Figures in parenthesis represent deficits.
SOURCE: Company and CAB reports

Airlines Running Ahead of 1952

New passenger-mile peak is expected this year, but rising costs and aircoach may hold down income.

Airline earnings are off to a good start with present indications pointing to industry-wide profits for the full year at least as good, if not better, than 1952.

Available reports for the first four or five months of 1953 show traffic, revenues and earnings running at substantial increases over like periods in 1952. For example, traffic for the 1953 March quarter was up some 26% over a year ago and exceeded the 21% year-to-year gain recorded in the final quarter of 1952. Operating revenues showed about the same gain during the current March quarter but net operating income was up almost 63% during the same period.

Of course, one reason for the comparative brightness of results for the first half of this year—particularly for the first three months—is the run of adverse circumstances that prevailed in the like periods of 1952. The accidents of last year and the temporary closing of Newark Airport in February (reopened in November), gasoline shortage and strikes all took a toll of traffic and earnings.

► **Barometer Rising**—Followed by the fine showing of the first quarter, the trend of rising traffic and operating income is continuing. Excellent gains were scored in April and are reflected in the cumulative four months' results that are presented in the accompanying table.

While the industry as a group showed net operating income of about $23.6 million for the first four months of 1953, up some 67% over a year ago, wide variations are present among the individual carriers.

► **Individual Results**—Eastern more than doubled its net operating income from $5.3 million to $10.2 million during this period. However, the early part of the year is Eastern's peak seasonal period with generally higher traffic and earnings prevailing. Yet, most of the other carriers have done well, too. American was up from $4.2 million to $6.9 million in net operating income.

Only Braniff ran counter to the trend. Despite an almost 50% increase in operating revenues, this carrier's net operating deficit almost doubled, rising

from $456,000 to $828,000 The company is seeking additional mail pay on both its international and domestic operations but the measure of relief, if any, is difficult to anticipate at the present time.

One of the very best earnings performances is being turned in by Capital Airlines Despite the short-haul characteristics of its route pattern the carrier has demonstrated an aggressive ability to generate an increasing measure of traffic with efficient conversion into profitable operations This is reflected in the net operating income of $632,000 for the first five months of 1953, in contrast with the $844,000 deficit of the same January-through-May period a year ago

▶**Effect of Coach**—The upward trend of traffic for the industry is known to have continued through May and June Profit margins may be narrowing, however, due to the rising percentage of coach business plus increasing costs of operation

With general business conditions expected to hold near their present levels in the near future, sustaining factors for good traffic should prevail throughout 1953 In addition to an increase of 19% to establish a record 121 billion revenue passenger miles last year for the domestic trunk airlines, another 20% gain, at least, is looked for to establish a new peak of more than 155 billion revenue passenger miles this year

Gross revenues may not follow the same ratio, due to rapid spread of air-coach Last year air-coach accounted for 19% of the total domestic trunk air travel market This year it may exceed 30%

Net operating income will, of course, be influenced by the degree of cost control that can be achieved in the face of increasing expenses Also of major import are the heavy depreciation charges due to accelerated amortization arising from equipment expansion programs by almost all carriers Integration expenses, as new planes are introduced in service, will also be present for a few companies

With various qualifications peculiar to airline forecasting, 1953 net operating income for the trunk carriers as a group may be expected to equal, and perhaps exceed, the $96 million reported last year Non-recurring profits from the sale of equipment, however, should be much lower this year The result may be that net income, after taxes, for 1953 could be below the approximately $50 million reported for 1952

In any event, slight changes in traffic, revenues and costs would alter this indication of 1953 final results by a wide margin —Selig Altschul

Flying the Comet Demands Light Touch

● What is it like to fly the world's first jet transport? What are the special control problems, fuel considerations?

● Aviation Week's Equipment Editor recently interviewed the crew of RCAF's first Comet and de Havilland specialists in Canada. Their views and DH's flight manual provide the basis for this article.

RCAF NOW IS FLYING its second Comet, which was delivered last month

By George L Christian

Uplands RCAF Base, Ont—Piloting a Comet jet transport takes the gentle touch of a race jockey astride a high strung thoroughbred.

With no feedback from the hydraulically operated control system, a pilot does not have positive feel of loads exerted on the elevators, is able to move them with a light stick force of approximately 12 lb.

De Havilland Aircraft Co., British maker of the jet liner, cautions that a gentle hand on the control column is needed at high speeds to avoid overstressing the transport An Indian government court of inquiry reported over-control last month as a possible cause of a British Overseas Airways Corp Comet crash near Calcutta May 2, suggested modification of the control system so pilot can feel loads imposed on control surfaces (AVIATION WEEK June 22, p 17)

▶**RCAF Enthusiasm**—Despite the demands of jet transport flight, crew members of the Royal Canadian Air Force's first Comet 1A told AVIATION WEEK they are "enthusiastic" about the new airliner.

Comet operation was outlined by four of the crew Squadron Leader J D Dickson, captain, Flight Lt Carl Brown, navigator, Flight Lt K A Wark, radio officer, and Flying Officer C W Bame, engineer

Additional information was supplied by de Havilland specialists D. A. Jermyn, airframes, and C. E Wright, avionics, and by B. S. Allen, representing de Havilland Engine Co

▶**Two-Speed Elevator**—As a buffer against overcontrol at high speeds and to give full elevator range during take-offs and landings, a two speed mechanism moves the surfaces

A coarse gear controls Comet elevators at speeds up to 200 knots Pilot normally switches to fine ratio for higher speeds, holding elevator movement to 63% of maximum travel

The jet transports may be landed using a fine setting if the gear does not return to a coarse setting However, nearly all available control movement is needed at low engine power if the center of gravity is forward

▶**Automatic Trim Tab**—De Havilland also built a guard against nosedown pitching moment that the Comet tends to develop at speeds of from Mach .77 to 795 At higher speeds, it becomes increasingly unstable longitudinally

An electrically powered trim tab, controlled by a machmeter, automatically nudges the aircraft into a slight noseup attitude as the aircraft passes its speed limit (Instrument panel holds a second machmeter to tell pilot his airspeed)

The device moves the gear mechanism from fine toward coarse, raises elevator until travel is stopped by an electronic switch Gear control automatically returns to fine ratio when the Comet's speed drops to Mach .76

▶**Precise Fuel Management**—In addition to meeting precise flight demands, Comet crews must figure exact fuel needs to assure sufficient emergency reserve but, at the same time, avoid carrying unnecessary loads

Five fuel requirements

- **Emergency reserve** of 1,700 lb always is carried Figured at 8 lb/gal., this totals 212.5 Imperial gal (265.6 standard gal)
- **Fuel to alternate airport** is worked out out on a basis of 85% of needs under the most adverse conditions
- **Flight plan reserve**, 5% of flight plan fuel, is added to compensate for navigation and weather forecast errors
- **Landing reserve** of an additional 1,600 lb. (200 Imperial gal) is carried to get the Comet from flight plan destination point, usually 1,000 ft. above the airport, to the runway Fuel is burned at the rate of 70 lb /min. in taxiing
- **Holding fuel** compensates for holding patterns ordered by destination or alternate airports before landing

Sum of these five requirements constitutes flight plan reserve

To determine flight plan fuel, Comet navigator totals basic weight of the jet transport, passengers, crew, baggage and cargo He adds the sum of these items, called empty tank weight, to flight plan reserve fuel total Result is weight overhead at destination

Because navigator has only the over-

Comet Landing Speeds

Gross weight	Over-the-fence speed*
60,000 lb	98 knots
70,000 lb	105 knots
80,000 lb	113 knots

* Touchdown speeds are approximately 10 kt less.

Comet Unstick Speeds

Gross takeoff weight	Indicated airspeed
80,000 lb	105 knots
90,000 lb	111 knots
100,000 lb	118 knots
115,000 lb	126 knots

Comet Technique

An indication of the gentle touch the Comet demands is given in these two paragraphs on handling the plane, taken from the de Havilland Comet 1 flight manual.

• "Stability. The aeroplane is generally stable about all three axes but there is nose-down pitching moment at a Machmeter reading which vary between 0.77 and 0.795, and the aeroplane becomes increasingly unstable longitudinally thereafter. Care must be taken when flying the aeroplane at high speed or high Mach numbers, not to allow the speed to increase inadvertently.

• "Elevator control force. A stick force of about 12 lb. is required to move the control column forwards or backwards from the trimmed position. Once this initial force has been applied the additional force required to apply positive or negative G is small and at high speeds the total stick force required to overstress the aeroplane is unusually light. Great care must therefore be taken when flying at speeds greater than the maneuvring speed not to use large elevator control movements."

head-at-destination weight, he must work out flight plan fuel in reverse—calculating backwards from that total. He determines fuel needed for descent, cruise and climb, adds 700 lb. for taxiing to takeoff. Final total gives fuel required and gross weight.

►**Exact Specific Gravity**—In an actual preflight preparation, the engineer checks fuel level by pulling out a drip stick built into the bottom of each Comet tank. The small open-ended tube is calibrated along its length. It is pulled down from the bottom wing surface until fuel begins running out of a bleed hole. Comet's engineer then reads quantity of fuel from the calibration. Part of the fuel flowing out of the tube is caught in a beaker, and its specific gravity is checked with a hydrometer.

Weight of fuel in the tank is determined by multiplying the number of gallons by the specific gravity reading, usually between 7.5 and 8.5.

Engineer figures fuel required by subtracting the amount on board from total requirements for the first leg of flight. He checks specific gravity in the refueling truck's supply and uses it to divide the number of pounds of fuel needed, resulting in the total gallons of new fuel to be taken aboard the airliner.

A graph tells what tanks to pump the fuel in, a process carried out at two single point, underwing fillers that allow 240 gpm. to be taken aboard at each filler.

Reason for checking specific gravity: Assuming the plane took on 5,000 gal. (maximum usable fuel capacity is 6,906 Imperial gal.) in hot weather at a specific gravity of 7.5, total fuel load would be 37,500 lb. In cold weather, specific gravity probably would be 8.5, giving the same load a total weight of 42,500 lb.—a difference of 5,000 lb.

►**Takeoff Position**—When the Comet reaches the end of the runway and is ready for takeoff, the engineer computes actual fuel used to taxi from the parking apron. He reports the corrected weight to the captain, who adds it to the original gross weight to get actual takeoff pound total.

If the jet transport takes off at its maximum gross weight of 115,000 lb., since No. 4 fuel tanks, at the wing tips, are aft of the plane's center of gravity, passengers are not permitted to go to the rear of the plane until 30 minutes after takeoff, when the fuel has been pumped from the tiptanks to the adjacent No. 3 tanks, removing the tail heavy condition.

►**Minimum Fuel**—When the Comet lands at its first stop, the engineer loads the "minimum sector fuel"—the least possible requirement for the next flight segment.

Meanwhile, the navigator calculates the exact amount and gives the correction to the engineer. This eliminates holding up the refueling until exact needs are known.

►**General Data**—Here are general procedures recommended by the de Havilland flight manual for RCAF's Comet 1A (technically, the jet liner is designated in the manual as the Comet 1xB because, while equipped for water-injection, the system is not operative yet).

• **Takeoff.** DH says the nose wheel should be raised from the runway between 80 and 85 kt. and control column moved forward immediately to make the wheel "skip" or barely touch the ground until the transport has reached takeoff speed.

The Comet should not take off with a crosswind component exceeding 26 kt.

• **Engine failure.** The only sure way to detect engine failure quickly on takeoff is by watching the tachometers, a job usually assigned to co-pilot.

• **Letdown.** During a recent demonstration flight, these were engine conditions during a 1,000 fpm. approach: Inboard engines were throttled back to hold tailpipe temperatures to 200C. Associated rpm. was 5,800. Outboard engines were held at 8,800 rpm., with tailpipe temperatures of 480C.

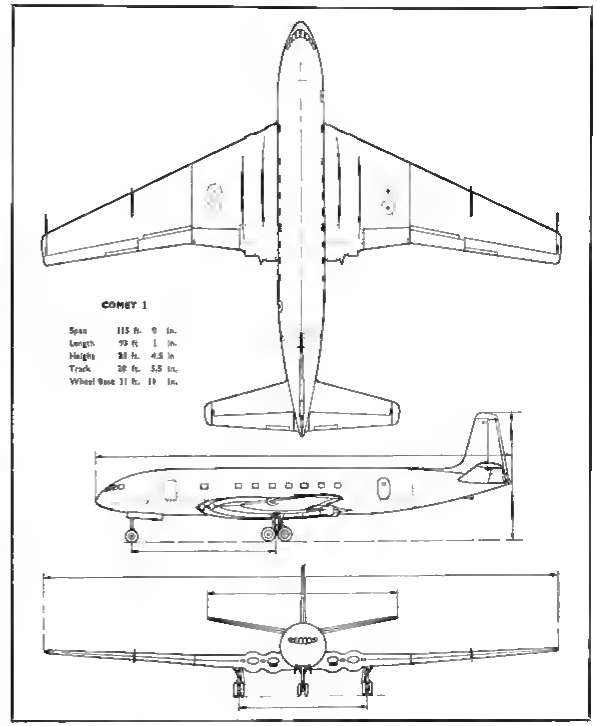
• **Landing.** On the same flight, the captain brought the Comet "over the fence" at approximately 110 kt. and touched down at 104 kt. He pulled the nose high at 90 kt. to slow the plane down. At 65 kt., the nose was brought onto the runway. Landing roll was 7,500 ft. and headwind was estimated at 20 mph.

With this maneuver, it was unnecessary to apply brakes until taxiing speed was reached.

Flaps extended at 60 deg. for aerodynamic braking. The plane offered considerable resistance to the air with the nose high and flaps at nearly right angles to the ground. Pilots are warned, however, not to extend flaps beyond 40 deg. on water-covered runways to avoid splash damage.

De Havilland also warns that when brakes are used at high ground speeds, care should be taken to avoid skidding the rear wheels of the bogies.

RCAF expressed some concern about being able to stop a transport as clean as the Comet on icy runways during the winter. A drogue chute undoubtedly would help, but crosswind landings with such a chute would present additional problems of directional control.



• **Stalling.** The Comet stalls gently with flaps up or extended 15 deg. Buffeting starts at approximately 10 kt. above stall speed, becomes increasingly severe as it approaches a full stall.

With flaps extended 40 to 60 deg. and carrying more than 100,000 lb., stalls also are gentle. But the warning buffet may be hidden by a slight bump that occurs at these flap positions.

During power on stalls, nose drop is pronounced and speed is about 4 to 5 kt. lower than normal.

►**Equipment**—Highlights of the RCAF Comet equipment:

• **Doors and hatches.** All doors and hatches open into the Comet to prevent blowout. Sills are wedge shaped so that doors and hatches seal tighter as differential pressure increases between inside and outside.

• **Airborne radar.** The jet liner carries cloud and collision early warning radar manufactured by the British firm, E. K. Cole. Maximum range is estimated at 40 mi., total weight is approximately 140 lb.

The RCAF Comet crew says the jet

frequently is out of order. Probable reason, they comment, is that the equipment is mounted in the Comet nose where it is subjected to considerable vibration from nose gear during ground operation. Suggested solution: better mount for the radar.

• **Instrument panel.** This unit is installed rigidly in the Comet, in contrast to shock mounted panels on piston powered aircraft.

▶ **Inside the Comet**—Inspection of the Comet during the demonstration flight revealed these points about its interior arrangements:

• **Cockpit.** The Comet's cockpit gives good visibility forward and to both sides. Engineer sits behind co-pilot; still further back and on the left, sits the navigator. Diagonally behind him and to the right, is the radio officer's location. With all five crew members in place, the cockpit is somewhat crowded.

• **Galley.** The plane's compact galley is located on the right side between the cockpit and the main cabin. Emergency hydraulic hand pump is in the galley area. Beside the galley is the crew entrance door—this moves inward, then slides overhead on two tracks. On the left side is a large baggage or cargo stowage area equipped with substantial doors having heavy tubular frames and smooth-functioning latches.

• **Forward cabin compartment.** Located just ahead of the wing's leading edge, it seats eight, four on each side of the aisle facing each other across removable tables.

• **Center compartment.** This seats 12 passengers in three rows of four seats, two on each side of the aisle. Ample leg room is provided. Up to this point in the Comet, going aft, the noise level in the plane is remarkably low. The loudest noise by far in the cockpit is the hum of radio dynamotors and the clack of solonoids as radio frequencies are changed.

• **Rear compartment.** Here are seats for 12 forward-facing passengers, plus two rearward-facing seats at the front of the compartment. Cabin attendant's seats are at the left rear.

Seat adjustment is awkward. A passenger has to grasp two handles, one with each hand and squeeze in latches with a fair amount of pressure. A child would have trouble. Then the two handles are pushed up or down to move the seat to desired position. The fully reclined position is considerably lower than full upright position.

▶ **General Observations**—The heating, ventilating and pressurization systems of the Comet are excellent. The cabin on the demonstration flight was always comfortable despite outside temperature variations from about 50F on the ground to −67F at 37,500 ft. There was scarcely any sensation of climbing or descending in the cabin although altitudes varied from almost sea level to 37,500 ft.

The seat belt arrangement is well thought out and provides for instantaneous release if desired. And there is no possibility of the belt buckle becoming jammed if high stresses are imposed on it, as may happen with some types of belts. To fasten, the loose end of the belt is placed in a groove in the buckle. The lower part of the buckle folds over the belt; then the top of the buckle folds down over the whole and easily snaps into place. A light tug on the top part of the buckle releases the whole unit.

▶ **Pilot Familiarization**—RCAF took delivery of its second Comet June 16 and has already put it into crew familiarization operation. The ferry flight from England took 9 23 hours, an hour and a half less than the first Comet's ferry time.

Squadron Leader Dickson, after some time on the service's original jet transport has these words of advice for those who join him in flying it:

"The Comet is different and requires different thinking. I think it is better for a Comet pilot to stick with the machine without too much diversion to other types of aircraft."

First Round Ends in Pacific Route Fight

- **NWA, TWA argue gains of competing with PAA.**
- **Transocean wants in, seeks no subsidy.**

By Lee Moore

Airlines battling for biggest and best Orient route awards from Civil Aeronautics Board and White House last week completed the first hurdle in the trans-Pacific route case: their arguments before CAB examiner Thomas Wrenn.

Northwest, TWA and Transocean are the aggressors, seeking routes competitive with Pan American. Pan American charges that duplication of its "thin" Orient routes would increase everybody's subsidy need.

The three certificated lines had paid little attention to the aircoach application of Transocean, a nonscheduled carrier, until TAL testified at the end of the hearing. Transocean wants non-subsidy aircoach passenger and cargo certification on a Central Pacific route: West Coast-Orient.

▶ **Opposition**—The certificated carriers oppose Transocean, however, on grounds that additional service on the direct, high-density route across the Pacific would skim the cream from earnings of the certificated airlines on their poorer Pacific routes, thereby increasing total subsidy need.

Major points made by each carrier before examiner Wrenn:

▶ **Trans World Airlines**—TWA advances two main points: benefits of competition, and U.S. prestige or "national interest," in the Orient. Details:

• **Route request.** TWA asks temporary renewal of its inactive India-China route, plus route extension to Tokyo and a rerouting of the China route until international politics permit reopening.

• **Competition.** Competition with Pan American should be granted, TWA says, because "historically and traditionally new business is stimulated when two American carriers are engaged in healthy regulated competition over high-density routes." TWA claims its route proposal, joining Northwest in Tokyo for 'round-the-world service competitive with PAA, would bring a total of at least $20 million more revenues for the three carriers.

• **National interest.** TWA president Ralph Damon argued that the U.S. should maintain national prestige in the Orient by having two great 'round-the-world services there instead of just one. Withdrawing TWA's India-China certificate would be taken by Oriental governments as a "diminution of U.S. interest" in the area, Damon said.

• **Aircoach leader.** TWA emphasized its plans for aircoach to the Orient next April 1, noted that it is the world's biggest aircoach operator today with 42 international and 168 domestic schedules a week.

• **Lowest cost.** Damon said TWA's ratio of commercial revenues to expenses shows it is lowest-cost U.S. flag line.

• **Let live.** TWA does not oppose renewal of Pan American or Northwest route renewal requests; in fact, it asks that CAB certificate Northwest's North Pacific route to Tokyo permanently. This is the connecting service upon which TWA would rely for its 'round the world connection.

• **Adequate equipment.** Damon announced purchase of eight Turbo Compound Super Constellations for 1955 delivery, with options for 12 more. This makes 98 Connie types available, he said. He added that the 78 TWA Connies already operating would enable the carrier to service the requested route extension before taking the new deliveries.

• **Tokyo junction.** TWA argued against Northwest over which should get the India-Japan extension—TWA eastward or NWA westward. Tokyo is the "ideal junction point," TWA says, because it is the industrial, military and cultural hub of the Orient now. Damon argued that Tokyo is not a poor market, as Pan American claims, but a great market deserving competitive through service. Tokyo's $57-million sales by U.S. carriers last year were second (after Paris' $66 million) among foreign ports, TWA said. London sales were $47 million.

• **Sales problem.** Trans World claimed that lack of through service to the Orient hurts its sales in Europe and the U.S. Give foreign lines plus Pan American can offer through service all the way.

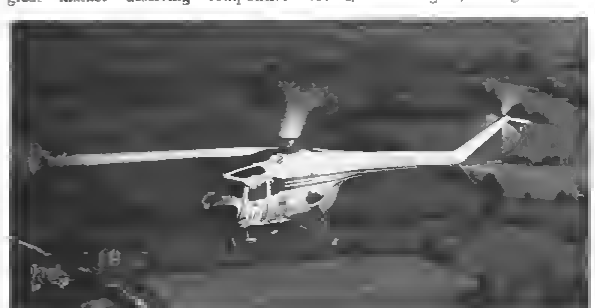
• **No extra subsidy.** TWA therefore alleged that the India-Japan route extension "would involve no subsidy requirements for TWA," or the industry. TWA based this claim on the idea that its and Northwest's basic world positions would be so strengthened as to offset cost of operating the Trans World extension.

▶ **Northwest Position**—Northwest's argument runs similar to TWA's—keep present routes and grant Japan-India extension competitive with Pan American. Big difference is over who should get the route extension.

Northwest now operates from Seattle to Alaska, Japan, Korea, Okinawa, Formosa and Manila. It wants renewal of its inactive extension to Hong Kong, plus new route to Calcutta via Bangkok.

• **No axe.** Northwest points out that it does not want to take anything away from Pan American and TWA.

• **Defends north route.** Northwest's big defensive operation is aimed at Pan American's application to serve the Orient via the short North Pacific routing now used by Northwest. Pan American has the advantage of greater sales appeal of its Central and South Pacific routes, NWA argues, adding that Pan



NEW BRISTOL COPTER JOINS BEA

Here is the first Bristol 171 Mk. 3 helicopter to be delivered to British European Airways for service linking London with major provincial cities. BEA has ordered two of these four-seat copters. They are the first British helicopters to be purchased by a British airline for scheduled domestic services. The Mk. 3 is similar to the Sycamore type being used in military service but has these modifications: redesigned fuselage giving increased luggage space, a side exhaust system, revised instrument panel and Decca navigation aids. Gross weight of the Mk. 3 has been quoted at 5,300 lb.

American duplication of the route would increase cost and hurt Northwest. In cross examination, Northwest attempted to show that Pan American seeks to get Northwest completely removed from any Pacific route.

▪ **Smallest operator.** Northwest presents itself as the smallest certificated applicant in the trans-Pacific route case, its life threatened by bigger PAA and TWA. Northwest says "blanketing" of its routes by TWA and Pan American would increase subsidy need of all three.

▪ **Low cost.** Northwest presented statistics to indicate that its Pacific costs are lower than Pan American's. Cost per revenue ton-mile 1947-52 was 73 cents, against 80 cents for Pan American, NWA says. Future subsidy mail-rates set by CAB would yield NWA 29 cents a ton-mile, 39 cents for Pan American, Northwest added.

▪ **Equipment.** Northwest recently ordered Turbo Compound Super Constellations. This decision was partly motivated by that plane's long range, to meet the threatened loss of the Shemya fuel stop between Anchorage and Tokyo, NWA said. Northwest plans 79-seat coach and 60-seat standard configuration.

▪ **National interest.** Northwest said it must certainly remain in Tokyo, as it already is the biggest U.S. company there, in number of employes and families, and has $1,700,000 invested in Anchorage and Tokyo to handle the Pacific service.

▪ **India extension.** Northwest claimed superior merit for extension between Japan and India, partly on the basis that the shortest distance from western U.S. to Calcutta is via its Pacific route.

▶ **Pan American Case**—Pan American said it asks no new competitive service. Its main plea is for the right to fly its passengers via the shortest air distance to Japan, which is the Great Circle North Pacific route, now a Northwest Airlines exclusive.

▪ **Pacific already competitive.** Pan American says TWA and Northwest got their Orient routes in 1946 when CAB did not anticipate the great growth of competitive foreign services. Now Philippine Air Lines carries half the trans-Pacific traffic from the Philippines, Japan has a flag line coming soon, Canadian Pacific is adding new equipment and British Overseas is contemplating trans-Pacific expansion. More Pacific competition will only bring more U.S. subsidy need, Pan American says.

▪ **India traffic thin.** The India-Japan route has much less traffic than trans-Pacific, yet is even more competitive, PAA says; six major foreign lines compete now, and Pan American finds requirement for only three flights a week —"less than any route in the U.S." Putting another U.S. carrier on the route would increase subsidy need and fill no useful purpose, PAA concludes.

▪ **Route changes.** Pan American asks permission to serve Okinawa and Formosa, with elimination of the present CAB restriction requiring a stop at Hong Kong. Pan American asks the right to use American Samoa as a stop when it gets adequate airport facilities.

▪ **Permanent certificate.** PAA wants all its Pacific certificates made permanent except Hong Kong-Calcutta, which should be considered six years hence when Calcutta-Europe comes up for renewal. Pan American now holds permanent certificates West Coast-Hong Kong and on other Pacific segments.

▪ **Pacific pioneer.** Pan American notes that it was first by several years in the Orient. That shows the company's

NEW SPANISH TRANSPORT WILL SEAT 38

New CASA 207 Azor twin-engine transport now under construction in Spain is shown in artist's conception. The all-metal Azor will set 30-38 passengers on 1,085-mi. routes. Its Bristol Hercules 1,690-hp. engines will give the plane an estimated top speed of 260 mph. at 5,000 ft. and cruise speed of 221 mph. at 10,000 ft. on 64% power. Design service ceiling will be 25,256 ft. and absolute ceiling 26,568 ft. Span will be approximately 91 ft., length 68 ft. and height 25 ft. Gross weight is given as 33,000 lb., empty weight as 21,604 lb. Retractable tricycle landing gear with single nose wheel and dual main wheels will be fitted, the latter gear folding up into the engine nacelles.

competitive drive, PAA argues Pan American started trans-Pacific service in 1935 with Martin M-130 flying boats

▶ **Transocean Aircoach** — Transocean stressed its record and future potential as an aircoach specialist, receiving no subsidy yet developing a mass market. TAL said its passenger service would be aircoach only, because the company believes that luxury trade raises costs and dilutes the main effort that should be devoted to expanding capacity and cutting costs.

The Oakland Port Authority and Chamber of Commerce support TAL's application on the same grounds.

As to the future potential of the Pacific to support competitive routes, Transocean said CAB must look ahead now, while the hearing is on, to the great future of Asia and ultimate opening of Communist-dominated areas to trade.

• **High-density route.** Transocean asks the right to give nonsubsidy passenger and cargo service on the high density route from Oakland and Burbank to Honolulu, Wake, Guam, Hong Kong and Tokyo, plus service to Okinawa and Formosa on demand.

• **Passenger service.** Transocean says it cannot settle for a scheduled cargo-only certificate, as the business will not support it until China trade opens up.

• **Schedule required.** Present restrictions on scheduling and frequency of its noncertificated operations severely limit possibility of developing low-fare service, TAL says.

• **Low fares.** Transocean would like to join International Air Transport Assn. to work on common problems, but would not be bound by its economic cartel "holding fares too high," TAL said. Transocean says it started with coach in 1946 and that has boosted its business while the subsidized lines priced themselves too high. Subsidy reliance prevents carriers from aggressive sales development, it says, and the company therefore urges CAB take advantage of Transocean's nonsubsidy service as a stimulant to the others as well as a measure of how much subsidy they really need.

• **Diplomatic problems.** Transocean said it would be "perfectly frank to say that it anticipates considerable early difficulty in securing permanent operating rights at Tokyo and Hong Kong" but believes that these problems could be worked out.

• **Finance.** Transocean said its fitness and ability are shown by rapid and continuing postwar expansion without subsidy and without funded debt.

• **No subsidy, luxury.** Transocean said it "finds no merit in offering any service at standard fares over routes where potential traffic density promises increased utilization of air service with lowered fares."

• **Airfreight mail.** Transocean's application does not request mail-carrying authority. However, "In view of the recent aggressive efforts of the Post Office Department to reduce its cost for the transportation of mail," Transocean lined to state for the record that it would be glad to haul mail in the Pacific. Other carriers objected, and examiner Wrenn struck this TAL statement from the record. But Transocean will press for reinstatement of its mail offer in the case record.

CAB ORDERS

(Week of July 6-12)

APPROVED

Resort Airlines, request to start serving additional points on its certificate. They are Chicago Ciudad Trujillo, D. R., San Juan, Charlotte Amalie, V. I., Ft. de France, F. W. I. and Christiansted, St. Croix, V. I.

Continental Airlines request to give free transportation to technicians observing its Convair 340s and DC-6Bs. Technicians include men from Pratt & Whitney, Hamilton Standard, Bendix Aviation, AiResearch, Sperry, Convair, Minneapolis-Honeywell and Douglas Aircraft.

Interlocking directorships of Leo J. Tracy with Railway Express Agency, Union Pacific R. R., and 10 other surface carriers.

Non-disclosure of financial terms of fuel and oil trucking contract between United Air Lines and Rogers Cartage Co.

Interline traffic agreements of Southwest Airways and Air France, and 15 other interline contracts.

Grover Loening's interlocking directorships of New York Airways and Fairchild Engine & Airplane Corp.; CAB deferred decision on Luis de Florez's similar directorships pending receipt of documentation.

Additional service to Fargo, N. D., and other points in north central states by United and Braniff Airways. CAB said grant of trunklines instead of local applicant, North Central Airlines, was an exception to the Board's normal policy of granting local routes to local carriers.

DENIED

American Airlines' proposal that CAB study whether Bonanza or Frontier Airlines should serve Nogales, Ariz. This was a motion in the Board investigation of service to Nogales.

Eastern Air Lines' "emergency" request to serve Dallas competitive with American. CAB ruled that there is no emergency, that such an application will be dealt with properly in the upcoming southwest service case.

Wiggins Airways renewal of its local service airline certificate (AVIATION WEEK July 13, p. 88). Northeast and Mohawk will serve parts of the dismembered route.

DELAYED

Authority to Ozark Air Lines to serve Pittsburg, Kan. CAB stayed its order pending consideration of objections by other air lines.

STARTED INVESTIGATING

Service to Fayetteville, Ark., and Muskogee, Okla. Braniff wants to drop Muskogee, Central wants to serve Fayetteville and Muskogee.

Merger or partial route acquisition of Lake Central Airlines. CAB consolidated proposals by North Central, Ozark and/or Transport Airgroup, Inc.

Various airlines' applications for route adjustments in the area of Braniff Mid Continent local service Route 106. CAB consolidated applications of Ozark, North Central and United with question of Braniff renewal of the route.

DISMISSED.

Petition of Airborne Flower and Freight Traffic, Inc., that CAB deny a license to Nationwide Packing Co. Nationwide withdrew voluntarily.

Investigation of semi-luxury aircoach service by Northwest Orient and Pacific Northern Airlines to Alaska. CAB said it found the carriers needed extra capacity for cargo.

U. S. Air Carriers Set Safety Record

Airline passenger safety has reached the point where the average person could fly across the North American continent or the Atlantic Ocean every week for nearly 2,000 years without fatal accident.

Scheduled airlines racked up an all-time safety record during the fiscal year ended June 30, with 0.35 fatalities per 100 million passenger miles. Previous record for U. S. domestic and international airlines combined was set last year at 0.90 for calendar 1952.

The regular carriers also flew more passengers farther than ever before in fiscal 1953. Air Transport Assn. conservatively estimates that 30 million passengers were flown 18 billion passenger-miles during the 12-month period.

ATA's monthly safety digest shows this tally:

Fatality index per 100 million passenger-miles
Fiscal Calendar

	1953	1952
Domestic	0.43	0.90
International	0.03	3.00
Combined	0.35	0.90

The official Civil Aeronautics Board record for domestic and international fatality index since 1938 is: 1938 5.2; 1939 2.3, 1940 2.8, 1941 2.2; 1942 3.1, 1943 1.7, 1944 2.6; 1945 2.4; 1946 1.6, 1947 2.7, 1948 1.3; 1949 1.0, 1950 1.3; 1951 1.3; 1952 0.9.

CAB Staff Supports Fair Profit on Mail

Trans World Airlines should get $3 million more and Pan American $1 million more per year than they now are receiving on temporary break-even mail rates if they are to make a reasonable profit on their Atlantic Divisions, the Civil Aeronautics Board staff recommends. These rates would be effective from Jan. 1, 1954 forward.

Public counsel for CAB's Bureau of Air Operations in the trans-Atlantic case believes TWA was overpaid a total of $1.8 million and Pan American $1.3 million for the seven year period 1946-52, prior to the setting of the temporary break-even rates.

The final rates now proposed include an estimate of what should yield a fair return on the carriers' recognized investment in transport operations. Future

rates proposed by counsel would pay PAA $12 5 million, TWA $7 million per year

▶**Decision Later**—Final CAB decision is expected by next spring, following initial decision by the examiner and oral argument procedures before the Board

For the future, bureau counsel figures the Pan American rate will yield a 9% or $4-million return on total investment allowed for rate-making purposes. This would allow a 3.1% return on the debt part of that investment and an 11% return on the common stockholders' equity, as recognized for rate making purposes

For TWA, the mail rate should yield an 8% or $2 4-million return on total investment allowed. This would be a 3.6% return on the debt portion and 11 8% on the equity portion of total investment allowed by CAB for rate-making purposes.

SHORTLINES

▶**Flying Tiger Line** has concluded a $2 million cargo contract with Air Force to shuttle materiel between Kelly Field and three Midwest bases for six months.

▶**Hawaii Legislature** has exempted Trans Pacific and Hawaiian Airlines from the 5% utilities tax but put them under the 2 5% gross income levy paid by other businesses in the territory The switch cuts their tax bill in half—from about $300,000 to $150,000

▶**North American Airlines** has converted a second 80 passenger DC-4 to backward-facing seats.

▶**Portland International Airport** has started work on its $2 million runway expansion program, including a runway parallel to the 8,800-ft northwest-southeast strip Work on terminal facilities will cost up to $5 million.

▶**Seaboard & Western Airlines** claims a record trans-Atlantic cargo flight, hauling 16,873 lb of mixed freight from New York to Britain and Germany in a DC-4. Seaboard also claims the previous eastbound record of 16,616 lb . . . S&WA on July 2 completed three years as a MATS prime contractor on the Korean airlift In that time the carrier made 2,145 trans-Pacific crossings and airlifted 19,072,000 lb of military freight and 22,277 passengers, including more than 1,061 litter patients returning home Freight ton miles totaled 57,660,423 and passenger ton-miles 14,954,079 In the last operational year ended July 2, the carrier flew 7,719,362 lb of military freight, more than 23% over previous years

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62	CQ-9	Eclipse	Clutch Switch (P810)
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19	15100-1B-A1	Eclipse	Pitch Trim Gauge
8	20000-43A-13A1	Eclipse	Magnesyn Transmitter
67	23000-2A	Eclipse	Magnesyn Indicator
15	22101-11-A4	Eclipse	Pressure Trans.
6	2225-11C-3A	Eclipse	Dual Tach
9	90100-42B-14A2	Eclipse	Torque Ind
9	20000-8A14	Eclipse	Magnesyn Pos. Ind
23	20100-11C-4-A1	Eclipse	Wing Flap Indicator
11	DW-33	Eclipse	Transformer
23	CQ-2	Eclipse	Switch Box
79	1195 4-A	Eclipse	Vibrator
80	DW 28	Eclipse	Transformer
11	2227-11 D3A	Eclipse	Tachometer
75	1415-12E	Eclipse	Starter
160	716-3A	Eclipse	Generator (NEA-3A)
384	564-8A	Eclipse	Oil Separator
71	828TY13Z2	Weston	OH Temp Indicator
40	119862	Weston	Carb. Air Temp Indicator
400	AN5780-2	Weston	Wheel & Flap Position Indicator
1000	AN5780-2	GE	Wheel & Flap Position Indicator
48	928TY12Z2	Weston	Dual Carb. Temp. Gauge
11	727TY70Z2	Weston	Air Temp. Ind
85	727TY72Z2	Weston	Air Temp Gauge
68	727TY73Z2	Weston	Air Temp. Gauge
83	727TY74Z2	Weston	Air Temp. Gauge
18	728-40Z2	Weston	Air Temp Gauge
21	GD-4A4Y	G.E.	Cowl Flap Ind
68	77C5	Lewis	Carb. Air Temp
16	76B19	Lewis	Cyl. Head Temp
23	77C3	Lewis	Oil Temp Gauge
13	77C4	Lewis	Oil Temp Ind
30	47B21	Lewis	Free Air Temp.
33	47B22	Lewis	Air Temp Gauge
58	47B23	Lewis	Air Temp. Gauge
54	47B24	Lewis	Air Temp Gauge
92	905-6-011	Kollsman	Diff. Press. Gauge
48	2548K-6-052	Kollsman	Diff. Press Gauge
33	DW 47	Eclipse	Transformer
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19	117 10	Edison	Control Box
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43	996990	Kidde	Interconnector
104	966679	Kidde	Pressure Control
225	951591	Kidde	Tee
151	A 4814	Kidde	Swith
47	M870036B	Kidde	CO2 Cyl.
74	923748	Kidde	Oxygen Cyl
326	982585	Kidde	Valve
385	AN6009-1B	Oh. Chmn.	Valve
247	AN6009-3A	Oh. Chmn.	Valve
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115	F4CA2A	Parker	Primer
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105	SP4-8746-78	Parker	Restrictor Valve
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125	D7818	Adel	Anti-Icer Pump
256	AN4014	Erie Meter	Wobble (D-3) Pump
45	AN4103-2	Clifford	Brass (Valve AU4785) Oil Cooler
90	AN3919-1	Scintilla	Ignition Switch
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48	PG20BAS7	Honeywell	Air Bott Switch
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20	V 32187	Aerotec	Pressure Relief Valve
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240	1265-908	Atex	Relief Valve
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140	K14949E	Marquette	Windshield Wiper Kit
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47	7264-404	Leach	Relay
22	M 3031	Air Associates	Actuator
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75	AYLZ2284	Barber-Coleman	Microanitemer
20	72400	Hiro Stand	Prop. Reversing Control
10	5X18	Woodward	Governor
46	AN14-A 9708P	Westinghouse	Contactor
26	70G3	G.E.	Transformer
718	B2A	Square D	Relay
6	83A9	Surface Combustion Co	Heater
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115	C6363 1-3A	Spencer	Circuit Breaker
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31	BORX 5	Allied	Relay
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20	A 1015-8	Aerotec	Pressure Switch
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468	D9530-2	Adel	Selector Valve
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237	D9596	Adel	Selector Valve
744	D10044	Adel	Selector Valve
244	D10051	Adel	Selector Valve
814	74847 (17Y PH3)	Aero Supply	Valve
335	AN5930-1	Whittaker	Valve
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68	AN5831 1	Parker	Valve
190	615-4A	Eclipse	Valve
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1998	K1593-4D	Kinkar	Valve
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775	AN3096-5	Grimes	Dome Light
1365	AN3096-6	Grimes	Dome Light
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93	48366	P & W	Shaft
75	48363	P & W	Shaft
36	48392	P & W	Sump
390	48451	P & W	Gear
78	76836	P & W	Gear
1178	84899	P & W	Bearing
113	84487	P & W	Housing
77	84591C	P & W	Nose Housing
200	48350-D	P & W	Crankcase Ass'y
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100	84084	P & W	Cylinder
200	84085	P & W	Cylinder
281	CR2791 G100-K4	G.E.	Relay
626	CR2795F101 A3	G E	Relay
41	G34464	Guardian	Relay
350	G31505 A	Guardian	Relay
22	146192	Vickers	Brake Valve
9	957-5	Eclipse	Check Valve
197	D12295	Adel	Pump
67	19100-2-1018	Kenyon	Check Valve
88	3135-11C	Eclipse	Pressure Switch
32	3V-117-HC	Fesco	Separator
100	27314	Purolator	Oil Filter
168	3801-38	Eclipse	Fuel Quan. Gauge
33	420313	Wright Aero	Pump Ass'y
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76	U635A (AN4000-28)	U.A.P.	Fuel Strainer
12	U8416-MM	U.A.P.	Oil Cooler Ass'y.
25	26875	Airesearch	Motor
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21	FD65-5	Diehl	Motor
91	3916	Bendix Radio	Control
23	3620	Bendix Radio	Station Box
335	GT (94-32376)	G.E.	Oxygen Pressure Signal Ass'y
180	AW-CV-1-1	U.S. Gauge	Check Valve
740	1C200	G E	Bulb Netsa Filter
15	1EAR-2105H	Pesco	Pump
7	SP1-445 8	Parker	Selector Valve
8	1E621	Pesco	Pump
29	NEP-2	Eclipse	Antilliary Power Unit
16	LER-30D	Lawrence	Auxiliary Power Unit
4	2CM46A2	G E.	Generator
6	2P248EB	Pesco	Fuel Pump
21	2P258SA	Pesco	Pump
148	AW-2-3/4-25K	U S Gauge	Manifold Press Gauge (Metric)
27363	CBE83N	Cesco	Rod End
16	SA/3A	Kidd	Impact Switch
13	3GB1D A18A	G E	Regulator
10273	AN100-K3L2	Fetric	Bearing
245	LMB-4	Micro	Switch
2094	PM-5	Spencer	Circuit Breaker
44	5BA03D-J4B	G.E.	Motor
31	5AM31J9A	G.E.	Amplidyne
111	5AM31N10	G.E.	Amplidyne
425	5BA40N11A	G.E.	Motor
189	5PD65-M81	G.E.	Motor
25790	NR6L15	Torrington	Bearing
26	MS46A	Bendix Bedix	Antenna Switch
45	D2050	C P Clare	Relay
208	787-1737P	Western	Air Temp Ind
2000	8909-K99	C.H.	Switch
2747	NAF310310-48	Cannon	Plug
402	NAF310310-50	Cannon	Plug
132	AN3209-B	Hydro Aire	Valve
50	AN6213-2	Bendix	Hyd. Valve
980	AN6229-4	Aeroquip	Hyd. Valve
27	AN6247 2	Adel	Hyd. Valve
14	UA8013-MM	United	Oil Cooler
1175	RS-2	Mallory	Selector Box
172	A7012	Delco	Motor
6	8DJ13ABK	G E	Tachometer Indicator
260	2222-1F-2A	Eclipse	Tachometer Indicator
28	AN5770-2	Manifold Maxwell Moore	Pressure Gauge
71	1003 4	Eclipse	Generator
427	NAF1016-1	Adams & Westlake	Light Ass'y
616	NAF1016-2	Adams & Westlake	Light Ass'y
1008	1 229RF	Leach	Relay
751	B1395T	Teleflex	Gear Box
130	B1394T	Teleflex	Gear Box

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One Is Better Than Two Is Better Than . . .

In a speech early this spring Benny Howard made reference to the optimum number of crew members for airline transports and in so doing aroused mafled feelings among some flight engineers. They felt that an attempt was being made to eliminate their services by a statement that the crash rate decreases when there is a decrease in the number of crew members.

Now Mr. Howard is particularly well adapted to speak for himself and usually does. But this subject of cockpit arrangement for that is the crux of the matter, is one of the fundamentals of aviation and it is a shame to have it misconstrued.

▶ Three Drivers—Perhaps an illustration would help. Can you imagine an automobile designed so that it took three people to drive it? One person to steer, one to shift and the third to handle the accelerator. What nonsense! But that is nearly the status of some of our airplanes.

For the benefit of the unhappy flight engineers it should be pointed out—just as Mr. Howard did—that the concern is only with those essential, or primary, controls which are involved in the safe operation of the plane. When these are designed so that several people are required to work them in rigidly specified order then we are disregarding safety.

▶ Only Insurance—It is another bit of common sense in aviation to duplicate pilots on large aircraft. This is not done so that the work load can be increased, or to make the second man an integral working part of the operation. The second man is insurance, like duplicating generators, or vacuum pumps, etc., so that total loss never hinges upon a single item. But for safety a single unit should be capable of handling the operation.

Now it so happens that we have progressed beyond the one-man airplane and in some cases beyond the two-man stage. Quite possibly we will progress to a required four man operation in the future. The progression (or is it regression?) is the result of added systems—pressurization, fire control, electric, etc.—but does not alter this. One man should be able to make a safe takeoff, safe landing, etc.

For those concerned with the question of job security a smarter way to view the whole problem is that the only way to provide this one-man operation is to further reduce the pilot's gadgets, that is, those not essential to safe flight, and give them to the second, or third man.

Repaging Airborne Radar

Just a few weeks ago this column spoke of the need for airborne radar as an aid to dodging severe weather, and specifically mentioned National's DC-6 in the Gulf of Mexico as a case in point. Within days after that writing the incontrovertible evidence was raised from the waters of the Gulf.

Much of the story has already been printed elsewhere and it will be remembered that the fuselage with right wing attached had previously been found. There was considerable damage along the belly and underside of the wing from contact with the water. The left wing eluded the grapplers but was finally found 2,100 ft. from the fuselage. When raised it showed extensive water damage ON THE TOP SIDE.

The only possible answer of course, is that the left wing parted company with the plane in the air and landed separately. As is well known several cracked spars have been found on DC-6s which resulted in beefing up the critical point. The break on National's 6 occurred outboard of this place.

▶ Mother Nature's Tantrums—The inference to be drawn from this is not that there is anything wrong with the Douglas product but rather that this is another illustration of the continued mastery of Mother Nature over man made structures. Apparently the only sure way to beat the old girl is to stay away from her when she is in a dither. Radar, where are you?

An interesting sidelight on this case concerns locating the wreckage. In the beginning all the usual interested parties worked feverishly with divers, grappling hooks, underwater sounding apparatus etc. The U. S. Navy was particularly cooperative in lending their best equipment.

Despite this high powered search nothing was found. As a final resort ALPA posted a $500 reward for the usual information leading to . . . The ink was hardly dry on the posters when local shrimp fishermen brought in the booty.

AVIATION CALENDAR

July 27-Aug. 2—1953 model airplane championship, U. S. Naval Air Station, Willow Grove, Pa.

Aug. 2—Amarillo, Tex., Jaycee Air Fair, observance of 50th anniversary of powered flight, Tradewind Airport.

Aug. 3-8—Fourth annual congress, International Astronautical Federation, Zurich.

Aug. 19-21—Western Electronic Show and Convention, San Francisco.

Aug. 19-24—Seventh International Model Plane Contest, sponsored by Plymouth Motor Corp., at Selfridge AFB and Belle Isle, Detroit.

Aug. 25—Ninth legal committee session, International Civil Aviation Organization, Rio de Janeiro. Meeting will study and revise a draft intended to replace or amend the Warsaw Convention international air law.

Sept. 5-7—National Aircraft Show and 50th anniversary of powered flight, Dayton (Ohio) Municipal Airport.

Sept. 7-13—1953 SBAC Coronation Year Flying Display, Farnborough, England.

Sept. 7-17—Fourth International Aeronautical Conference, joint meeting of RAeS and IAS, London.

Sept. 9-11—Air safety seminar of Flight Safety Foundation. Probable location, Luxembourg.

Sept. 12-13—Third Wisconsin air pageant, Curtiss-Wright Airport, Milwaukee.

Sept. 21-25—Eighth National Instrument Exhibit, Instrument Society of America, Sherman Hotel, Chicago.

Sept. 23-24—1953 meeting of Aircraft Spark Plug and Ignition Conference, Champion Spark Plug Co., Toledo.

Sept. 28-30—Ninth annual meeting, National Electronics Conference, Hotel Sherman, Chicago.

Sept. 29-Oct. 3—National Aeronautics Meeting, Aircraft Engineering Display and Aircraft Production Forum of the Society of Automotive Engineers, Hotel Statler, Los Angeles.

Sept. 30-Oct. 1—Aircraft electric equipment conference, American Institute of Electrical Engineers, Seattle.

Oct. 10—England-Christchurch (New Zealand) air race, with speed and transport handicap sections.

Oct. 10-17—Fifth annual all-Texas air tour, sponsored by Texas Aeronautics Commission, Austin.

Oct. 14-15—Annual airport development and operation conference, sponsored by New York Department of Commerce, Onondaga Hotel, Syracuse, N. Y.

Oct. 28-30—Annual convention of Southeastern Airport Managers' Assn., Marlin Beach Hotel, Ft. Lauderdale, Fla.

Nov. 3-4—1953 Transport Aircraft Hydraulics Conference, sponsored by Vickers, Inc., Hotel Park Shelton, Detroit.

Nov. 16-17—Aircraft Quality Control Conference of the Aircraft Technical Committee, American Society for Quality Control, the Biltmore Hotel, Dayton, Ohio.

Nov. 17-18—First regular meeting of the Operations Research Society of America, National Bureau of Standards, Washington, D. C.

ADVERTISERS IN THIS ISSUE

AVIATION WEEK—JULY 20, 1953

EDITORIAL

Travel Dollars Take to the Air

New statistics dramatize the sweeping trend of American travelers from railroads to airlines.

Monthly progress reports have been spewing from the major airline publicity offices at such a speedy pace this year that the public is getting lost in millions and billions of passenger-miles, revenue passenger miles, seat-miles, available seat-miles, and the rest of the jargon of our business. Confused as it may be about the exact meaning of some of these terms, the public does have the single conviction that the airlines are growing tremendously.

Obviously, the public is right. The acid test of any public service is the extent to which the public chooses to spend its hard-earned dollars for that service. Comparison of passenger revenues garnered by the ten leading air and rail carriers for the five years through 1952 paints an impressive growth picture.

Pennsy Gives Up First Place

In five years the mighty Pennsylvania Railroad, the world's richest, has been nudged out of first place in passenger revenues by American Airlines. The New York Central—which has just celebrated its 100th anniversary—was ousted from its second place spot in passenger revenues and relegated to fourth place, with United Air Lines taking over No. 3 position. Eastern Air Lines retained fifth place, but its passenger revenues jumped from $59 million to $105 million. Trans World Airlines climbed from No. 8 to No. 6, passing the Santa Fe and New Haven Railroads.

In 1948, four of the top eight passenger air and rail carriers were airlines. In 1952, four of the top six passenger carriers, dollar wise, were airlines.

Only two of the six top railroad passenger-revenue producers improved income in the period, whereas all of the four airlines racked up enormous improvement in passenger revenues—one showing more than 100% gain.

The tables follow.

Comparison of 1948 and 1952

1948 Passenger Revenues
Ten Leading Airlines & Railroads

1. Pennsylvania R. R.	$160,000,000
2. New York Central R. R.	136,000,000
3. AMERICAN AIRLINES	76,000,000
4. UNITED AIR LINES	66,000,000
5. EASTERN AIR LINES	59,000,000
6. New Haven R. R.	56,000,000
7. Santa Fe R. R.	53,000,000
8. TRANS WORLD AIRLINES	49,000,000
9. Southern Pacific R. R.	48,000,000
10. Union Pacific R. R.	42,000,000

1952 Passenger Revenues
Ten Leading Airlines & Railroads

1. AMERICAN AIRLINES	$158,000,000
2. Pennsylvania R. R.	156,000,000
3. UNITED AIR LINES	126,000,000
4. New York Central R. R.	124,000,000
5. EASTERN AIR LINES	105,000,000
6. TRANS WORLD AIRLINES	100,000,000
7. Santa Fe R. R.	58,000,000
8. Southern Pacific R. R.	53,000,000
9. New Haven R. R.	52,000,000
10. Long Island R. R.	37,000,000

Revenues from passenger operations of all Class I railroads reflected a loss in 1952, for the seventh consecutive year, of $643 million, which absorbed 37% of the operating profit produced by railroad freight service.

Yes, the public is switching by the thousands from rail to air transportation, but the long-term possibilities for new passenger business are still barely tapped. What better incentives are there than the five-year growth figures above for further improving service, efficiency and economy, guarding safety, maintaining the present first-class and coach fares, and fighting bureaucratic interference?

The Operation Was a Success; Everybody's Still Alive

Detroit has shown us that you can attract 150,000 citizens to a four-day air show without staging a Roman holiday of death defying racing, stunting and acrobatics.

Instead, plane capabilities were stressed both on the ground and in the air. It was not surprising that the public was interested in the excellent Air Force, Army and Navy showings. But it was astonishing the way visitors flocked to inspect an Eastern Air Lines Super Constellation. During the show's two biggest days there were long lines of folks waiting to see it. "Show people, impressed by the interest in something many of them considered humdrum, will likely try for broader exhibits of standard transports next time," our correspondent writes.

So the result was a constructive and definitely educational show, with no people killed. It can be done, and our bets are off to Detroit for proving it. Other air show promoters would please take notice. Aviation is really growing up.

—Robert H. Wood

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